City of Aurora
Building Codes Division
15151 E Alameda Pkwy
Aurora, CO 80012
(303) 739-7420

Notice

This material is subject to copyright protection pursuant to Federal Law: 17 United States Code Section 106.

HYDRAULIC

CALCULATIONS

AND / OR

PRODUCT

SUBMITTALS

Scott J. Dahms
Nicet 3-99320
12/26/07

SPRINKLER SYSTEM ANALYSIS (IMPERIAL)
CALCULATION #1

Contractor : CODE FIRE, LLC
Company Address:4896 Van Gordon Street, Wheat Ridge, CO 80033

DATE: 12.17.2007

JOB NAME : Medical Center of Aurora

ADDRESS : 1501 S Potomac, Aurora, CO

Description:REMOTE AREA #1

DESIGNER : DHolcombe

Authority : Aurora

CONTRACT #LO7013 REF. TO DRAWING #2 OF 8

HAZARD DESCRIPTION: STANDPIPE
*

CALCULATION CRITERIA:-
TOTAL AREA : 1.0 SQ.FT.
DENSITY : 1.000 USGPM/SQ.FT.
Max.AREA/SPRINKLER : 500.0 SQ.FT.
OF SPRINKLER : 1
Min. Safety : 0 PSI

SYSTEM REQUIREMENT:-

Node	System GPM	Hose GPM	Hydrant GPM	Total GPM	Pressure PSI
18	500.00	250.00	0.00	750.00	161.71

SOURCE INFORMATION:-

SUPPLY	STATIC PRESSURE	RESIDUAL PRESSURE	RESIDUAL FLOW
28	52.83 PSI	31.77 PSI	1500.0 GPM

FIRE PUMP RATING:

PUMP	PRESSURE	FLOW
18	135.00 PSI	750.0 GPM

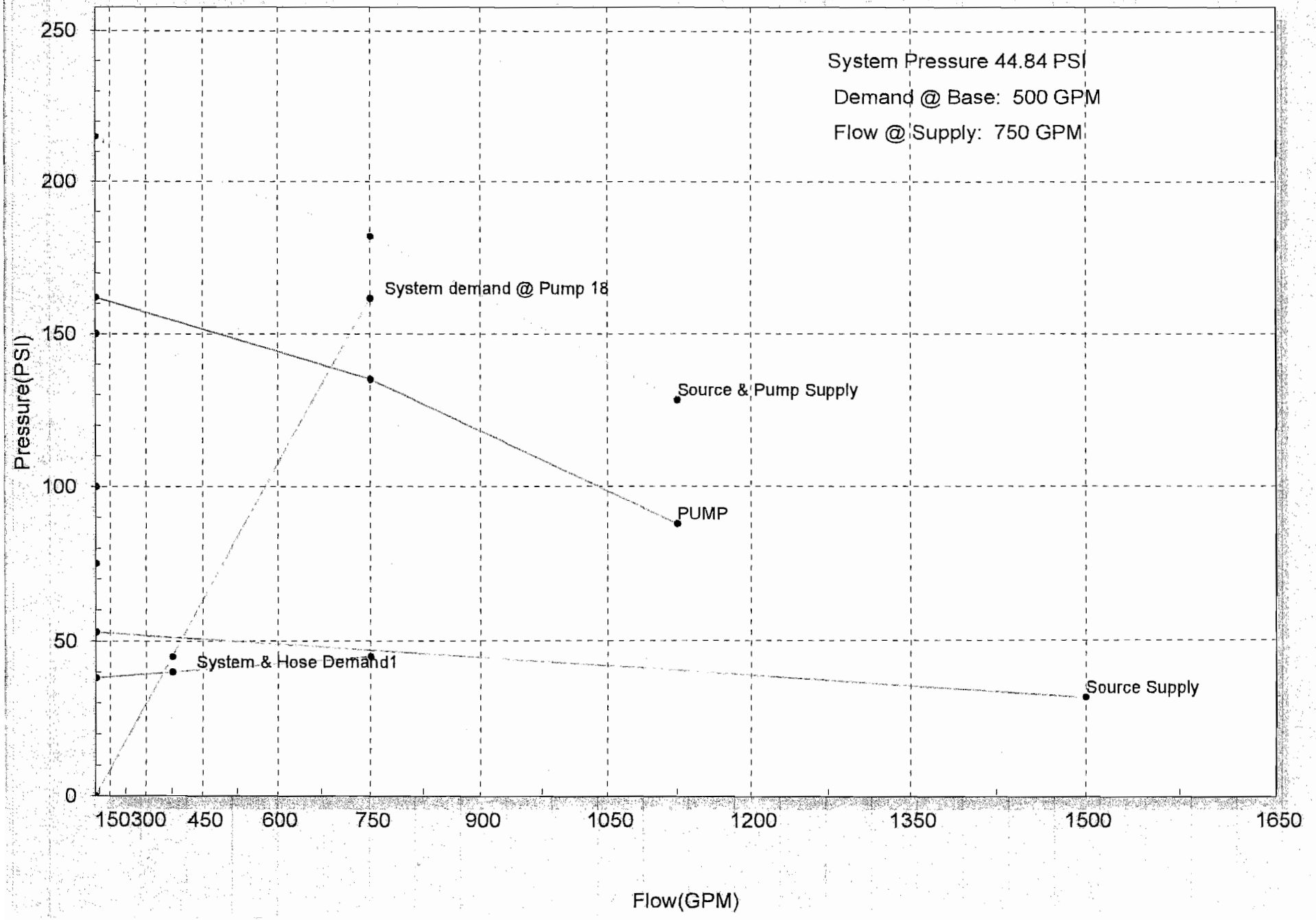
SPRINKLER K= 50.00
OVERHEAD PIPE C= 120/150
UNDERGROUND C= 140

TOTAL SAFETY = 2.15 PSI Below Supply

FILE: C:\fireacad\calc\MCOA standpipe 1 plus.mdb

Water Graph

FireAcad



CODE FIRE, LLC

SPRINKLER SYSTEM ANALYSIS (IMPERIAL)

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA standpipe 1 plus.mdb

NODE	ELEVATION FT.	PRESSURE PSI	DISCHARGE GPM	WASTAGE %
1	87.5	100.00	500.0	0.0
2	87.5	109.70		
3	79.7	113.50		
4	51.7	127.09		
5	37.7	133.89		
6	23.7	140.68		
7	11.2	148.21		
8	11.2	149.80		
9	11.2	150.96		
10	11.2	152.05		
11	10.8	153.55	250.0	HOSE
12	10.8	154.04		
13	10.8	154.36		
14	1.1	159.41		
15	1.1	160.68		
16	1.1	161.36		
17	1.1	161.70		
18	1.1	161.71		
19	1.1	36.71		
20	1.1	36.73		
21	1.1	37.21		
22	3.1	37.01		
23	3.1	37.06		
24	3.1	42.07		
25	1.0	43.32		
26	0.0	44.03		
27	0.0	44.09		
28	0.0	44.84		

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA standpipe 1 plus.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	1	QN=500.0		L=0.5		PT=100.00	K=50.00
1			D=2.703	F=18.7	0.505	PF=9.70	V=27.96
				FT=T		PE=0.00	C=120.00
	2	QP=500.0		LT=19.2		PT=109.70	Pv=5.26
	2	QN=0.0		L=7.8		PT=109.70	K=0.00
2			D=4.310	F=0.0	0.052	PF=0.41	V=11.00
				FT=0		PE=3.39	C=120.00
	3	QP=500.0		LT=7.8		PT=113.50	Pv=0.81
	3	QN=0.0		L=28.0		PT=113.50	K=0.00
3			D=4.310	F=0.0	0.052	PF=1.46	V=11.00
				FT=0		PE=12.13	C=120.00
	4	QP=500.0		LT=28.0		PT=127.09	Pv=0.81
	4	QN=0.0		L=14.0		PT=127.09	K=0.00
4			D=4.310	F=0.0	0.052	PF=0.73	V=11.00
				FT=0		PE=6.07	C=120.00
	5	QP=500.0		LT=14.0		PT=133.89	Pv=0.81
	5	QN=0.0		L=14.0		PT=133.89	K=0.00
5			D=4.310	F=0.0	0.052	PF=0.73	V=11.00
				FT=0		PE=6.07	C=120.00
	6	QP=500.0		LT=14.0		PT=140.68	Pv=0.81
	6	QN=0.0		L=12.5		PT=140.68	K=0.00
6			D=4.310	F=27.9	0.052	PF=2.10	V=11.00
				FT=T		PE=5.42	C=120.00
	7	QP=500.0		LT=40.4		PT=148.21	Pv=0.81
	7	QN=0.0		L=2.8		PT=148.21	K=0.00
7			D=4.310	F=27.9	0.052	PF=1.60	V=11.00
				FT=T		PE=0.00	C=120.00
	8	QP=500.0		LT=30.7		PT=149.80	Pv=0.81
	8	QN=0.0		L=45.5		PT=149.80	K=0.00
8			D=6.065	F=72.0	0.010	PF=1.16	V=5.55
				FT=3ET		PE=0.00	C=120.00
	9	QP=500.0		LT=117.5		PT=150.96	Pv=0.21
	9	QN=0.0		L=82.1		PT=150.96	K=0.00
9			D=6.065	F=28.0	0.010	PF=1.09	V=5.55
				FT=2E		PE=0.00	C=120.00
	10	QP=500.0		LT=110.1		PT=152.05	Pv=0.21
	10	QN=0.0		L=69.8		PT=152.05	K=0.00
10			D=6.065	F=68.0	0.010	PF=1.36	V=5.55
				FT=2ETB		PE=0.14	C=120.00
	11	QP=500.0		LT=137.8		PT=153.55	Pv=0.21

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA standpipe 1 plus.mdb

NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
11	QN=250.0		L=9.3		PT=153.55	K=0.00
		D=6.065	F=14.0	0.021	PF=0.49	V=8.33
			FT=E		PE=0.00	C=120.00
12	QP=750.0		LT=23.3		PT=154.04	Pv=0.47
12	QN=0.0		L=1.5		PT=154.04	K=0.00
		D=6.065	F=14.0	0.021	PF=0.32	V=8.33
			FT=E		PE=0.00	C=120.00
13	QP=750.0		LT=15.5		PT=154.36	Pv=0.47
13	QN=0.0		L=9.3		PT=154.36	K=0.00
		D=6.065	F=30.0	0.021	PF=0.82	V=8.33
			FT=T		PE=4.22	C=120.00
14	QP=750.0		LT=39.3		PT=159.41	Pv=0.47
14	QN=0.0		L=1.1		PT=159.41	K=0.00
		D=6.065	F=60.0	0.021	PF=1.28	V=8.33
			FT=2T		PE=0.00	C=120.00
15	QP=750.0		LT=61.1		PT=160.68	Pv=0.47
15	QN=0.0		L=2.1		PT=160.68	K=0.00
		D=6.065	F=30.0	0.021	PF=0.67	V=8.33
			FT=T		PE=0.00	C=120.00
16	QP=750.0		LT=32.1		PT=161.36	Pv=0.47
16	QN=0.0		L=3.3		PT=161.36	K=0.00
		D=6.065	F=13.0	0.021	PF=0.34	V=8.33
			FT=C		PE=0.00	C=120.00
17	QP=750.0		LT=16.3		PT=161.70	Pv=0.47
17	QN=0.0		L=0.8		PT=161.70	K=0.00
		D=6.065	F=0.0	0.021	PF=0.02	V=8.33
			FT=0		PE=0.00	C=120.00
18	QP=750.0		LT=0.8		PT=161.71	Pv=0.47
19					PT=161.71	
	PUMP RATE125.0 PSI @ 750.0 GPM POWER 54.7 HP					
18					PT=36.71	
19	QN=0.0		L=0.8		PT=36.71	K=0.00
		D=6.065	F=0.0	0.021	PF=0.02	V=8.33
			FT=0		PE=0.00	C=120.00
20	QP=750.0		LT=0.8		PT=36.73	Pv=0.47
20	QN=0.0		L=5.9		PT=36.73	K=0.00
		D=6.065	F=17.0	0.021	PF=0.48	V=8.33
			FT=GE		PE=0.00	C=120.00
21	QP=750.0		LT=22.9		PT=37.21	Pv=0.47

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA standpipe 1 plus.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	21	QN=0.0		L=2.0		PT=37.21	K=0.00
21			D=6.065	F=30.0	0.021	PF=0.67	V=8.33
				FT=T		PE=-0.87	C=120.00
	22	QP=750.0		LT=32.0		PT=37.01	Pv=0.47
	22	QN=0.0		L=2.4		PT=37.01	K=0.00
22			D=6.065	F=0.0	0.021	PF=0.05	V=8.33
				FT=0		PE=0.00	C=120.00
	23	QP=750.0		LT=2.4		PT=37.06	Pv=0.47
	23	QN=0.0		L=4.7		PT=37.06	K=0.00
23			D=6.065	F=0.0	0.002	PF=5.00	V=8.33
				FT=F,5		PE=0.00	C=120.00
	24	QP=750.0		LT=4.7		PT=42.07	Pv=0.47
	24	QN=0.0		L=2.6		PT=42.07	K=0.00
24			D=6.065	F=14.0	0.021	PF=0.35	V=8.33
				FT=E		PE=0.90	C=120.00
	25	QP=750.0		LT=16.6		PT=43.32	Pv=0.47
	25	QN=0.0		L=25.0		PT=43.32	K=0.00
25			D=8.044	F=53.5	0.003	PF=0.27	V=4.73
				FT=EE		PE=0.43	C=150.00
	26	QP=750.0		LT=78.5		PT=44.03	Pv=0.15
	26	QN=0.0		L=19.0		PT=44.03	K=0.00
26			D=8.044	F=0.0	0.003	PF=0.07	V=4.73
				FT=0		PE=0.00	C=150.00
	27	QP=750.0		LT=19.0		PT=44.09	Pv=0.15
	27	QN=0.0		L=167.0		PT=44.09	K=0.00
27			D=8.390	F=62.6	0.003	PF=0.74	V=4.35
				FT=GT		PE=0.00	C=140.00
	28	QP=750.0		LT=229.6		PT=44.84	Pv=0.13

SPRINKLER SYSTEM ANALYSIS (IMPERIAL)
CALCULATION #2

Contractor : CODE FIRE, LLC
Company Address:4896 Van Gordon Street, Wheat Ridge, CO 80033

DATE: 12.17.2007

JOB NAME : Medical Center of Aurora

ADDRESS : 1501 S Potomac, Aurora, CO

Description:REMOTE AREA #2

DESIGNER : DHolcombe

Authority : Aurora

CONTRACT #LO7013 REF. TO DRAWING #8 OF 8

HAZARD DESCRIPTION: LIGHT
*

CALCULATION CRITERIA:-
TOTAL AREA : 900 SQ.FT.
DENSITY : 0.100 USGPM/SQ.FT.
Max.AREA/SPRINKLER : 220.0 SQ.FT.
OF SPRINKLER : 10
Min. Safety : 0 PSI

SYSTEM REQUIREMENT:-

Node	System GPM	Hose GPM	Hydrant GPM	Total GPM	Pressure PSI
18	289.69	0.00	100.00	389.69	162.90

SOURCE INFORMATION:-

SUPPLY	STATIC PRESSURE	RESIDUAL PRESSURE	RESIDUAL FLOW
28	52.83 PSI	31.77 PSI	1500.0 GPM

FIRE PUMP RATING:

PUMP	PRESSURE	FLOW
18	135.00 PSI	750.0 GPM

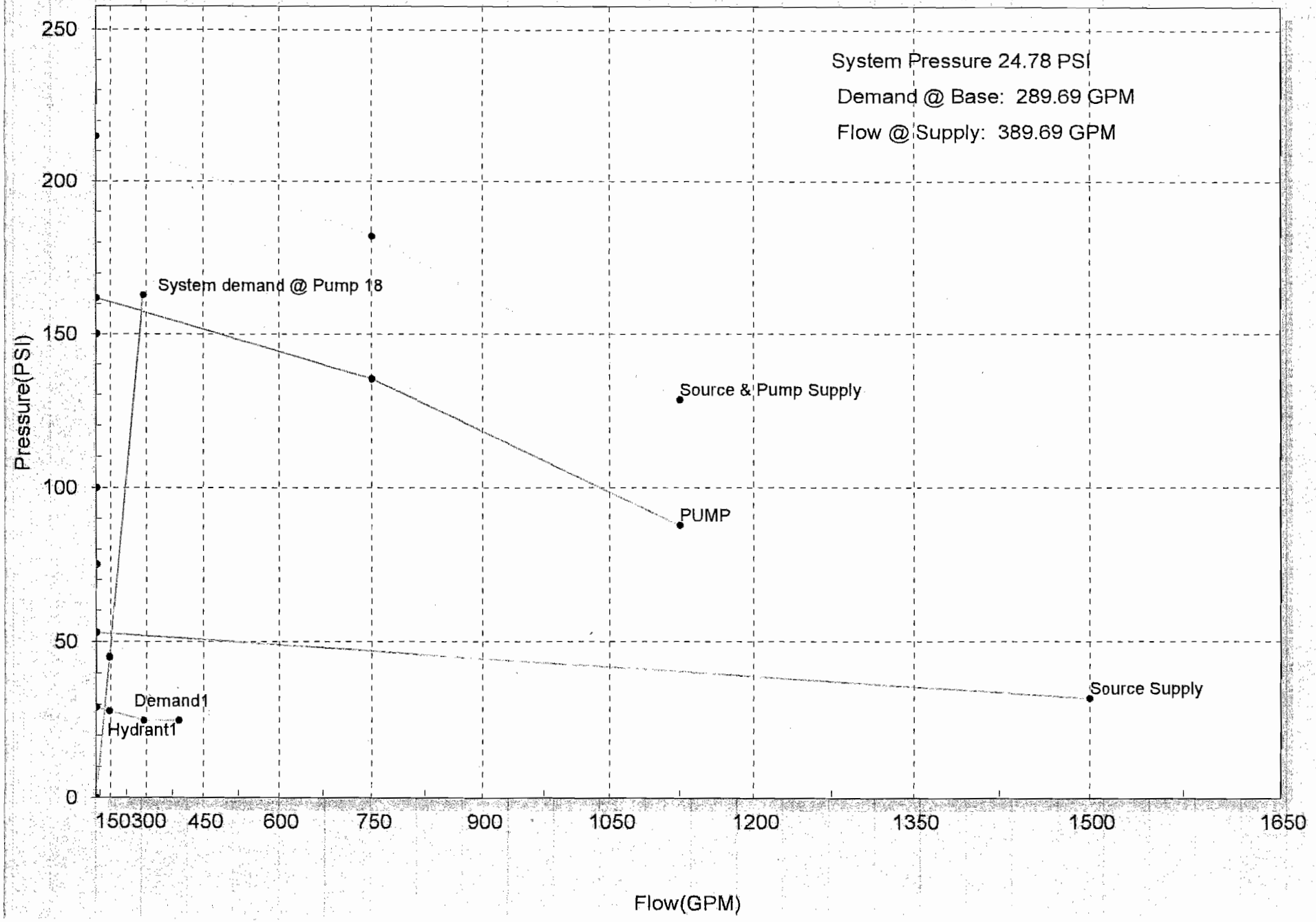
SPRINKLER K= 5.60
OVERHEAD PIPE C= 120/150
UNDERGROUND C= 140

TOTAL SAFETY = 26.31 PSI Below Supply

FILE: C:\fireacad\calc\MCOA 5th 2.mdb

Water Graph

FireAcad



CODE FIRE, LLC

SPRINKLER SYSTEM ANALYSIS (IMPERIAL)

OB NAME: Medical Center of Aurora
'ILE: C:\fireacad\calc\MCOA 5th 2.mdb

NODE	ELEVATION FT.	PRESSURE PSI	DISCHARGE GPM	WASTAGE %
3	65.7	131.25		
4	51.7	137.58		
5	37.7	143.91		
6	23.7	150.24		
7	11.2	156.42		
8	11.2	156.54		
9	11.2	156.96		
10	11.2	157.36		
11	10.8	158.00		
12	10.8	158.08		
13	10.8	158.14		
14	1.1	162.50		
15	1.1	162.72		
16	1.1	162.84		
17	1.1	162.90		
18	1.1	162.90		
19	1.1	18.85		
20	1.1	18.85		
21	1.1	18.93		
22	3.1	18.18		
23	3.1	18.19		
24	3.1	23.19		
25	1.0	24.16		
26	0.0	24.64		
27	0.0	24.65		
28	0.0	24.78	100.0	HOSE
100	65.0	15.74	22.2	1.0
101	65.7	15.86		
102	65.0	15.44	22.0	0.0
103	65.7	15.55		
104	65.0	19.07	24.5	11.1
105	65.7	19.27		
106	65.0	19.19	24.5	11.5
107	65.7	19.40		
108	65.7	17.41		
109	65.7	21.11		
110	65.7	21.67		
111	65.7	51.71		
112	65.0	35.24	33.2	51.1
113	65.7	35.82		
114	65.0	36.48	33.8	53.7
115	65.7	37.08		
116	65.7	36.85		
117	65.7	39.20		
118	65.7	51.53		
119	65.0	33.82	32.6	48.0

NODE	ELEVATION FT.	PRESSURE PSI	DISCHARGE GPM	WASTAGE %
120	65.7	34.36		
121	65.0	35.55	33.4	51.8
122	65.7	37.16		
123	65.7	51.61		
124	65.0	31.79	31.6	43.5
125	65.7	32.28		
126	65.0	32.40	31.9	44.9
127	65.7	32.91		
128	65.7	52.47		
129	65.7	59.82		
130	65.7	66.51		
131	65.7	78.14		
132	66.3	80.42		
133	66.3	88.99		
134	65.7	55.05		
135	67.3	55.97		
136	67.3	61.12		
137	65.7	63.44		
138	65.7	70.86		
139	65.7	75.86		
140	65.7	85.54		
141	65.7	86.33		
142	65.7	33.26		
143	65.7	34.85		
145	65.7	93.08		
146	65.7	111.21		
147	65.7	117.90		

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA 5th 2.mdb

PE o.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	3	QN=0.0		L=14.0		PT=131.25	K=0.00
			D=4.310	F=0.0	0.019	PF=0.27	V=6.37
				FT=0		PE=6.07	C=120.00
	4	QP=289.7		LT=14.0		PT=137.58	Pv=0.27
	4	QN=0.0		L=14.0		PT=137.58	K=0.00
			D=4.310	F=0.0	0.019	PF=0.27	V=6.37
				FT=0		PE=6.07	C=120.00
	5	QP=289.7		LT=14.0		PT=143.91	Pv=0.27
	5	QN=0.0		L=14.0		PT=143.91	K=0.00
			D=4.310	F=0.0	0.019	PF=0.27	V=6.37
				FT=0		PE=6.07	C=120.00
	6	QP=289.7		LT=14.0		PT=150.24	Pv=0.27
	6	QN=0.0		L=12.5		PT=150.24	K=0.00
			D=4.310	F=27.9	0.019	PF=0.77	V=6.37
				FT=T		PE=5.42	C=120.00
	7	QP=289.7		LT=40.4		PT=156.42	Pv=0.27
	7	QN=0.0		L=2.8		PT=156.42	K=0.00
			D=6.065	F=30.0	0.004	PF=0.12	V=3.22
				FT=T		PE=0.00	C=120.00
	8	QP=289.7		LT=32.8		PT=156.54	Pv=0.07
	8	QN=0.0		L=45.5		PT=156.54	K=0.00
3			D=6.065	F=72.0	0.004	PF=0.42	V=3.22
				FT=3ET		PE=0.00	C=120.00
	9	QP=289.7		LT=117.5		PT=156.96	Pv=0.07
	9	QN=0.0		L=82.1		PT=156.96	K=0.00
9			D=6.065	F=28.0	0.004	PF=0.40	V=3.22
				FT=2E		PE=0.00	C=120.00
	10	QP=289.7		LT=110.1		PT=157.36	Pv=0.07
	10	QN=0.0		L=69.8		PT=157.36	K=0.00
10			D=6.065	F=68.0	0.004	PF=0.49	V=3.22
				FT=2ETB		PE=0.14	C=120.00
	11	QP=289.7		LT=137.8		PT=158.00	Pv=0.07
	11	QN=0.0		L=9.3		PT=158.00	K=0.00
11			D=6.065	F=14.0	0.004	PF=0.08	V=3.22
				FT=E		PE=0.00	C=120.00
	12	QP=289.7		LT=23.3		PT=158.08	Pv=0.07
	12	QN=0.0		L=1.5		PT=158.08	K=0.00
12			D=6.065	F=14.0	0.004	PF=0.06	V=3.22
				FT=E		PE=0.00	C=120.00
	13	QP=289.7		LT=15.5		PT=158.14	Pv=0.07

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA 5th 2.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	13	QN=0.0		L=9.3		PT=158.14	K=0.00
13			D=6.065	F=30.0	0.004	PF=0.14	V=3.22
				FT=T		PE=4.22	C=120.00
	14	QP=289.7		LT=39.3		PT=162.50	Pv=0.07
	14	QN=0.0		L=1.1		PT=162.50	K=0.00
14			D=6.065	F=60.0	0.004	PF=0.22	V=3.22
				FT=2T		PE=0.00	C=120.00
	15	QP=289.7		LT=61.1		PT=162.72	Pv=0.07
	15	QN=0.0		L=2.1		PT=162.72	K=0.00
15			D=6.065	F=30.0	0.004	PF=0.12	V=3.22
				FT=T		PE=0.00	C=120.00
	16	QP=289.7		LT=32.1		PT=162.84	Pv=0.07
	16	QN=0.0		L=3.3		PT=162.84	K=0.00
16			D=6.065	F=13.0	0.004	PF=0.06	V=3.22
				FT=C		PE=0.00	C=120.00
	17	QP=289.7		LT=16.3		PT=162.90	Pv=0.07
	17	QN=0.0		L=0.8		PT=162.90	K=0.00
17			D=6.065	F=0.0	0.004	PF=0.00	V=3.22
				FT=0		PE=0.00	C=120.00
	18	QP=289.7		LT=0.8		PT=162.90	Pv=0.07
	19					PT=162.90	
18		PUMP RATE144.0 PSI @ 289.7 GPM POWER 24.3 HP					
	18					PT=18.85	
	19	QN=0.0		L=0.8		PT=18.85	K=0.00
19			D=6.065	F=0.0	0.004	PF=0.00	V=3.22
				FT=0		PE=0.00	C=120.00
	20	QP=289.7		LT=0.8		PT=18.85	Pv=0.07
	20	QN=0.0		L=5.9		PT=18.85	K=0.00
20			D=6.065	F=17.0	0.004	PF=0.08	V=3.22
				FT=GE		PE=0.00	C=120.00
	21	QP=289.7		LT=22.9		PT=18.93	Pv=0.07
	21	QN=0.0		L=2.0		PT=18.93	K=0.00
21			D=6.065	F=30.0	0.004	PF=0.11	V=3.22
				FT=T		PE=-0.87	C=120.00
	22	QP=289.7		LT=32.0		PT=18.18	Pv=0.07
	22	QN=0.0		L=2.4		PT=18.18	K=0.00
22			D=6.065	F=0.0	0.004	PF=0.01	V=3.22
				FT=0		PE=0.00	C=120.00
	23	QP=289.7		LT=2.4		PT=18.19	Pv=0.07

OB NAME: Medical Center of Aurora
'ILE: C:\fireacad\calc\MCOA 5th 2.mdb

'E).	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	23	QN=0.0		L=4.7		PT=18.19	K=0.00
			D=6.065	F=0.0	0.000	PF=5.00	V=3.22
				FT=F,5		PE=0.00	C=120.00
	24	QP=289.7		LT=4.7		PT=23.19	Pv=0.07
	24	QN=0.0		L=2.6		PT=23.19	K=0.00
			D=6.065	F=14.0	0.004	PF=0.06	V=3.22
				FT=E		PE=0.90	C=120.00
	25	QP=289.7		LT=16.6		PT=24.16	Pv=0.07
	25	QN=0.0		L=25.0		PT=24.16	K=0.00
)			D=8.044	F=53.5	0.001	PF=0.05	V=1.83
				FT=EE		PE=0.43	C=150.00
	26	QP=289.7		LT=78.5		PT=24.64	Pv=0.02
	26	QN=0.0		L=19.0		PT=24.64	K=0.00
5			D=8.044	F=0.0	0.001	PF=0.01	V=1.83
				FT=0		PE=0.00	C=150.00
	27	QP=289.7		LT=19.0		PT=24.65	Pv=0.02
	27	QN=0.0		L=167.0		PT=24.65	K=0.00
7			D=8.390	F=62.6	0.001	PF=0.13	V=1.68
				FT=GT		PE=0.00	C=140.00
	28	QP=289.7		LT=229.6		PT=24.78	Pv=0.02
	100	QN=22.2		L=0.7		PT=15.74	K=5.60
31			D=1.080	F=2.3	0.138	PF=0.41	V=7.78
				FT=E		PE=-0.29	C=120.00
	101	QP=22.2		LT=3.0		PT=15.86	Pv=0.41
	101	QN=0.0		L=5.4		PT=15.86	K=0.00
32			D=1.080	F=5.8	0.138	PF=1.55	V=7.78
				FT=T		PE=0.00	C=120.00
	108	QP=22.2		LT=11.2		PT=17.41	Pv=0.41
	102	QN=22.0		L=0.7		PT=15.44	K=5.60
33			D=1.080	F=2.3	0.136	PF=0.40	V=7.71
				FT=E		PE=-0.29	C=120.00
	103	QP=22.0		LT=3.0		PT=15.55	Pv=0.40
	103	QN=0.0		L=7.9		PT=15.55	K=0.00
34			D=1.080	F=5.8	0.136	PF=1.86	V=7.71
				FT=T		PE=0.00	C=120.00
	108	QP=22.0		LT=13.7		PT=17.41	Pv=0.40
	108	QN=0.0		L=7.5		PT=17.41	K=0.00
35			D=1.080	F=0.0	0.494	PF=3.70	V=15.49
				FT=0		PE=0.00	C=120.00
	109	QP=44.2		LT=7.5		PT=21.11	Pv=1.61

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA 5th 2.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	104	QN=24.5		L=0.7		PT=19.07	K=5.60
36			D=1.080	F=2.3	0.165	PF=0.49	V=8.56
				FT=E		PE=-0.29	C=120.00
	105	QP=24.5		LT=3.0		PT=19.27	Pv=0.49
	105	QN=0.0		L=5.4		PT=19.27	K=0.00
37			D=1.080	F=5.8	0.165	PF=1.85	V=8.56
				FT=T		PE=0.00	C=120.00
	109	QP=24.5		LT=11.2		PT=21.11	Pv=0.49
	106	QN=24.5		L=0.7		PT=19.19	K=5.60
38			D=1.080	F=2.3	0.166	PF=0.49	V=8.59
				FT=E		PE=-0.29	C=120.00
	107	QP=24.5		LT=3.0		PT=19.40	Pv=0.50
	107	QN=0.0		L=7.9		PT=19.40	K=0.00
39			D=1.080	F=5.8	0.166	PF=2.27	V=8.59
				FT=T		PE=0.00	C=120.00
	110	QP=24.5		LT=13.7		PT=21.67	Pv=0.50
	109	QN=0.0		L=0.5		PT=21.11	K=0.00
40			D=1.080	F=0.0	1.115	PF=0.56	V=24.05
				FT=0		PE=0.00	C=120.00
	110	QP=68.7		LT=0.5		PT=21.67	Pv=3.89
	110	QN=0.0		L=9.5		PT=21.67	K=0.00
41			D=1.080	F=5.8	1.963	PF=30.04	V=32.65
				FT=T		PE=0.00	C=120.00
	111	QP=93.2		LT=15.3		PT=51.71	Pv=7.17
	118	QN=0.0		L=18.6		PT=51.53	K=0.00
42			D=2.104	F=0.0	0.010	PF=0.18	V=2.84
				FT=0		PE=0.00	C=120.00
	111	QP=30.8		LT=18.6		PT=51.71	Pv=0.05
	112	QN=33.2		L=0.7		PT=35.24	K=5.60
43			D=1.080	F=2.3	0.291	PF=0.86	V=11.64
				FT=E		PE=-0.29	C=120.00
	113	QP=33.2		LT=3.0		PT=35.82	Pv=0.91
	113	QN=0.0		L=1.3		PT=35.82	K=0.00
44			D=1.080	F=2.3	0.291	PF=1.03	V=11.64
				FT=E		PE=0.00	C=120.00
	116	QP=33.2		LT=3.6		PT=36.85	Pv=0.91
	116	QN=0.0		L=8.1		PT=36.85	K=0.00
45			D=1.080	F=0.0	0.291	PF=2.35	V=11.64
				FT=0		PE=0.00	C=120.00
	117	QP=33.2		LT=8.1		PT=39.20	Pv=0.91

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA 5th 2.mdb

PE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	114	QN=33.8		L=0.7		PT=36.48	K=5.60
			D=1.080	F=2.3	0.300	PF=0.89	V=11.85
				FT=E		PE=-0.29	C=120.00
	115	QP=33.8		LT=3.0		PT=37.08	Pv=0.94
	115	QN=0.0		L=1.3		PT=37.08	K=0.00
			D=1.080	F=5.8	0.300	PF=2.12	V=11.85
				FT=T		PE=0.00	C=120.00
	117	QP=33.8		LT=7.1		PT=39.20	Pv=0.94
	117	QN=0.0		L=5.8		PT=39.20	K=0.00
3			D=1.080	F=5.8	1.067	PF=12.33	V=23.49
				FT=T		PE=0.00	C=120.00
	118	QP=67.1		LT=11.6		PT=51.53	Pv=3.71
	118	QN=0.0		L=6.3		PT=51.53	K=0.00
9			D=2.104	F=0.0	0.013	PF=0.08	V=3.35
				FT=0		PE=0.00	C=120.00
	123	QP=36.3		LT=6.3		PT=51.61	Pv=0.08
	119	QN=32.6		L=0.7		PT=33.82	K=5.60
0			D=1.080	F=2.3	0.280	PF=0.83	V=11.41
				FT=E		PE=-0.29	C=120.00
	120	QP=32.6		LT=3.0		PT=34.36	Pv=0.88
	120	QN=0.0		L=10.0		PT=34.36	K=0.00
1			D=1.080	F=0.0	0.280	PF=2.80	V=11.41
				FT=0		PE=0.00	C=120.00
	122	QP=32.6		LT=10.0		PT=37.16	Pv=0.88
	121	QN=33.4		L=0.7		PT=35.55	K=5.60
52			D=1.080	F=5.8	0.293	PF=1.90	V=11.69
				FT=T		PE=-0.29	C=120.00
	122	QP=33.4		LT=6.5		PT=37.16	Pv=0.92
	122	QN=0.0		L=8.2		PT=37.16	K=0.00
53			D=1.080	F=5.8	1.035	PF=14.45	V=23.10
				FT=T		PE=0.00	C=120.00
	123	QP=66.0		LT=14.0		PT=51.61	Pv=3.59
	123	QN=0.0		L=9.5		PT=51.61	K=0.00
54			D=2.104	F=0.0	0.091	PF=0.86	V=9.44
				FT=0		PE=0.00	C=120.00
	128	QP=102.3		LT=9.5		PT=52.47	Pv=0.60
	124	QN=31.6		L=0.7		PT=31.79	K=5.60
55			D=1.080	F=2.3	0.264	PF=0.78	V=11.06
				FT=E		PE=-0.29	C=120.00
	125	QP=31.6		LT=3.0		PT=32.28	Pv=0.82

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA 5th 2.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	125	QN=0.0		L=1.4		PT=32.28	K=0.00
56			D=1.080	F=2.3	0.264	PF=0.98	V=11.06
				FT=E		PE=0.00	C=120.00
	142	QP=31.6		LT=3.7		PT=33.26	Pv=0.82
	142	QN=0.0		L=6.0		PT=33.26	K=0.00
57			D=1.080	F=0.0	0.264	PF=1.59	V=11.06
				FT=0		PE=0.00	C=120.00
	143	QP=31.6		LT=6.0		PT=34.85	Pv=0.82
	126	QN=31.9		L=0.7		PT=32.40	K=5.60
61			D=1.080	F=2.3	0.269	PF=0.80	V=11.16
				FT=E		PE=-0.29	C=120.00
	127	QP=31.9		LT=3.0		PT=32.91	Pv=0.84
	127	QN=0.0		L=1.4		PT=32.91	K=0.00
62			D=1.080	F=5.8	0.269	PF=1.94	V=11.16
				FT=T		PE=0.00	C=120.00
	143	QP=31.9		LT=7.2		PT=34.85	Pv=0.84
	143	QN=0.0		L=12.5		PT=34.85	K=0.00
63			D=1.080	F=5.8	0.963	PF=17.62	V=22.22
				FT=T		PE=0.00	C=120.00
	128	QP=63.4		LT=18.3		PT=52.47	Pv=3.32
	128	QN=0.0		L=33.2		PT=52.47	K=0.00
64			D=2.104	F=0.0	0.221	PF=7.34	V=15.29
				FT=0		PE=0.00	C=120.00
	129	QP=165.7		LT=33.2		PT=59.82	Pv=1.57
	129	QN=0.0		L=30.3		PT=59.82	K=0.00
65			D=2.104	F=0.0	0.221	PF=6.70	V=15.29
				FT=0		PE=0.00	C=120.00
	130	QP=165.7		LT=30.3		PT=66.51	Pv=1.57
	130	QN=0.0		L=47.0		PT=66.51	K=0.00
66			D=2.104	F=5.5	0.221	PF=11.62	V=15.29
				FT=E		PE=0.00	C=120.00
	131	QP=165.7		LT=52.5		PT=78.14	Pv=1.57
	131	QN=0.0		L=0.6		PT=78.14	K=0.00
67			D=2.104	F=10.9	0.221	PF=2.55	V=15.29
				FT=T		PE=-0.27	C=120.00
	132	QP=165.7		LT=11.5		PT=80.42	Pv=1.57
	132	QN=0.0		L=27.8		PT=80.42	K=0.00
68			D=2.104	F=10.9	0.221	PF=8.58	V=15.29
				FT=T		PE=0.00	C=120.00
	133	QP=165.7		LT=38.7		PT=88.99	Pv=1.57

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA 5th 2.mdb

PE	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	133	QN=0.0		L=0.6		PT=88.99	K=0.00
			D=2.104	F=5.5	0.623	PF=3.82	V=26.73
				FT=E		PE=0.27	C=120.00
	145	QP=289.7		LT=6.1		PT=93.08	Pv=4.81
	145	QN=0.0		L=18.2		PT=93.08	K=0.00
			D=2.104	F=10.9	0.623	PF=18.13	V=26.73
				FT=T		PE=0.00	C=120.00
	146	QP=289.7		LT=29.1		PT=111.21	Pv=4.81
	146	QN=0.0		L=5.3		PT=111.21	K=0.00
			D=2.104	F=5.5	0.623	PF=6.70	V=26.73
				FT=E		PE=0.00	C=120.00
	147	QP=289.7		LT=10.8		PT=117.90	Pv=4.81
	147	QN=0.0		L=4.0		PT=117.90	K=0.00
2			D=2.104	F=17.4	0.623	PF=13.33	V=26.73
				FT=BT		PE=0.01	C=120.00
	3	QP=289.7		LT=21.4		PT=131.25	Pv=4.81
	111	QN=0.0		L=14.9		PT=51.71	K=0.00
3			D=2.104	F=10.9	0.129	PF=3.34	V=11.44
				FT=T		PE=0.00	C=120.00
	134	QP=124.0		LT=25.8		PT=55.05	Pv=0.88
	134	QN=0.0		L=1.6		PT=55.05	K=0.00
4			D=2.104	F=10.9	0.129	PF=1.62	V=11.44
				FT=T		PE=-0.70	C=120.00
	135	QP=124.0		LT=12.5		PT=55.97	Pv=0.88
	135	QN=0.0		L=28.9		PT=55.97	K=0.00
75			D=2.104	F=10.9	0.129	PF=5.15	V=11.44
				FT=T		PE=0.00	C=120.00
	136	QP=124.0		LT=39.8		PT=61.12	Pv=0.88
	136	QN=0.0		L=1.6		PT=61.12	K=0.00
76			D=2.104	F=10.9	0.129	PF=1.62	V=11.44
				FT=T		PE=0.70	C=120.00
	137	QP=124.0		LT=12.5		PT=63.44	Pv=0.88
	137	QN=0.0		L=57.3		PT=63.44	K=0.00
77			D=2.104	F=0.0	0.129	PF=7.42	V=11.44
				FT=0		PE=0.00	C=120.00
	138	QP=124.0		LT=57.3		PT=70.86	Pv=0.88
	138	QN=0.0		L=38.6		PT=70.86	K=0.00
78			D=2.104	F=0.0	0.129	PF=4.99	V=11.44
				FT=0		PE=0.00	C=120.00
	139	QP=124.0		LT=38.6		PT=75.86	Pv=0.88

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA 5th 2.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	139	QN=0.0		L=63.9		PT=75.86	K=0.00
79			D=2.104	F=10.9	0.129	PF=9.68	V=11.44
				FT=T		PE=0.00	C=120.00
	140	QP=124.0		LT=74.8		PT=85.54	Pv=0.88
	140	QN=0.0		L=0.6		PT=85.54	K=0.00
80			D=2.104	F=5.5	0.129	PF=0.79	V=11.44
				FT=E		PE=0.00	C=120.00
	141	QP=124.0		LT=6.1		PT=86.33	Pv=0.88
	141	QN=0.0		L=11.8		PT=86.33	K=0.00
81			D=2.104	F=10.9	0.129	PF=2.93	V=11.44
				FT=T		PE=-0.27	C=120.00
	133	QP=124.0		LT=22.7		PT=88.99	Pv=0.88

GEND

= Standard 45 degree elbow	QN = Normal flow discharge
= Standard 90 degree elbow	QP = Flow; in; pipe
= Long turn degree elbow	D = Pipe inside diameter
= Standard tee	L = Pipe length
= Butterfly valve	F = Fitting equivalence
= Gate valve	FT = Fitting type
= Check valve	LT = Total length
= Alarm valve	PT = Total node pressure
= Dry pipe valve	PF = Pressure friction loss
= Deluge valve	PE = Pressure elevation loss
= Pre-action valve	K = Sprinkler K-factor
= Back flow preventer	V = Velocity
x = Constant pressure x in PSI for fitting F	C = C-factor
	PV = Velocity pressure

SIGNIFICANT HYDRAULICAL NOTES:

aximum velocity of 32.65 FT/SEC at pipe 41
ost remote sprinkler @ node 102

SPRINKLER SYSTEM ANALYSIS (IMPERIAL)
CALCULATION #3

Contractor : CODE FIRE, LLC
Company Address:4896 Van Gordon Street, Wheat Ridge, CO 80033

DATE: 12.21.2007

JOB NAME : Medical Center of Aurora

ADDRESS : 1501 S Potomac, Aurora, CO

Description:REMOTE AREA #3

DESIGNER : DHolcombe

Authority : Aurora

CONTRACT #LO7013 REF. TO DRAWING #3 OF 8

HAZARD DESCRIPTION: LIGHT
*

CALCULATION CRITERIA:-
TOTAL AREA : 1950.0 SQ.FT.
DENSITY : 0.100 USGPM/SQ.FT.
Max.AREA/SPRINKLER : 168.0 SQ.FT.
OF SPRINKLER : 13
Min. Safety : 0 PSI

SYSTEM REQUIREMENT:-

Node	System GPM	Hose GPM	Hydrant GPM	Total GPM	Pressure PSI
18	307.55	0.00	100.00	407.55	152.00

SOURCE INFORMATION:-

SUPPLY	STATIC PRESSURE	RESIDUAL PRESSURE	RESIDUAL FLOW
28	52.83 PSI	31.77 PSI	1500.0 GPM

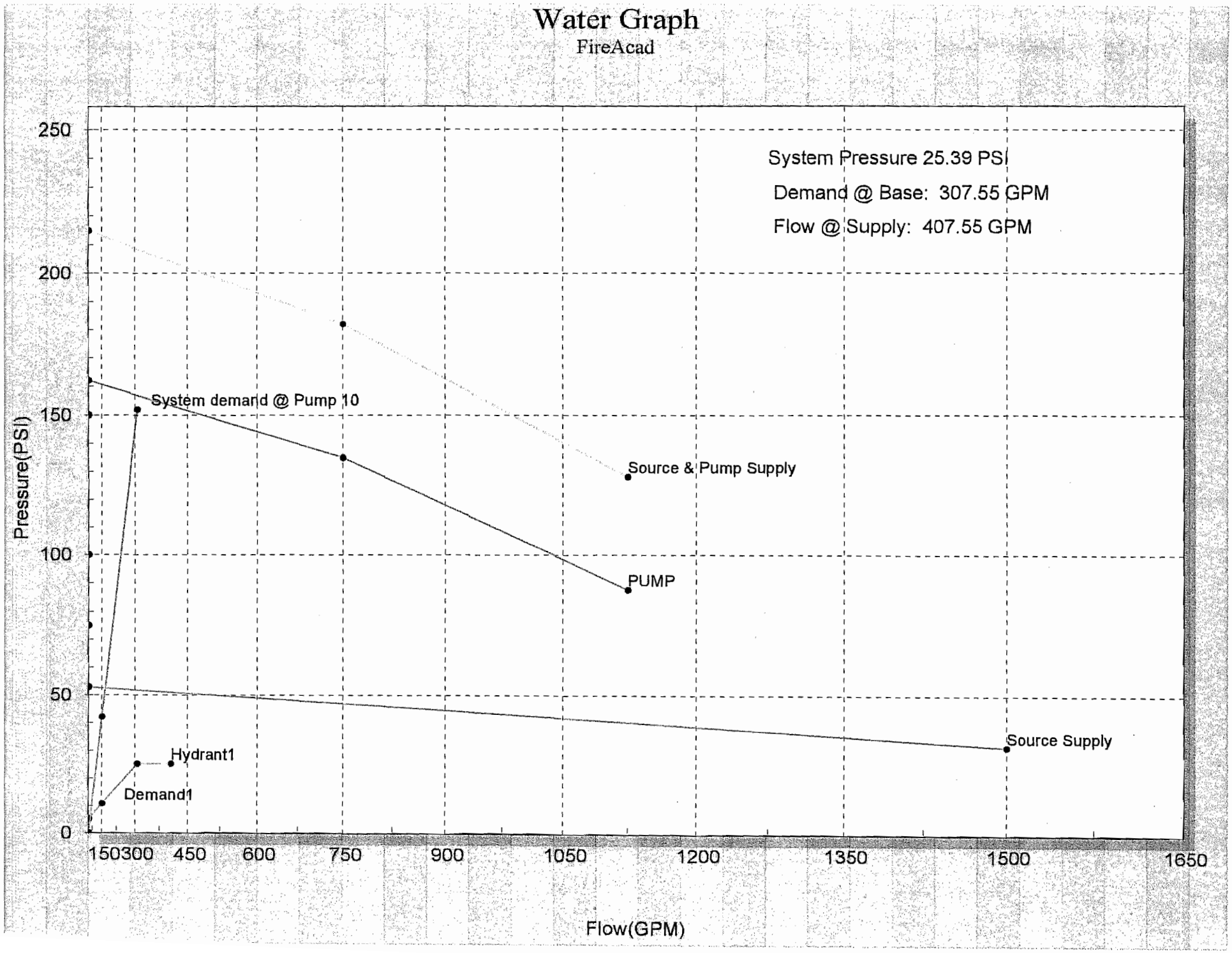
FIRE PUMP RATING:

PUMP	PRESSURE	FLOW
10	135.00 PSI	750.0 GPM

SPRINKLER K= 5.60
OVERHEAD PIPE C= 150/120/100
UNDERGROUND C= 140

TOTAL SAFETY = 25.55 PSI Below Supply

FILE: C:\fireacad\calc\MCOA Dry 3.mdb


Water Graph
FireAcad
System Pressure 25.39 PSI
Demand @ Base: 307.55 GPM
Flow @ Supply: 407.55 GPM
System demand @ Pump 10
Source & Pump Supply
PUMP
Source Supply
Hydrant1
Demand1
Pressure(PSI)
Flow(GPM)
250
200
150
100
50
0
150300
450
600
750
900
1050
1200
1350
1500
1650

CODE FIRE, LLC

SPRINKLER SYSTEM ANALYSIS (IMPERIAL)

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Dry 3.mdb

NODE	ELEVATION FT.	PRESSURE PSI	DISCHARGE GPM	WASTAGE %
15	1.1	151.81		
16	1.1	151.94		
17	1.1	152.00		
18	1.1	152.00		
19	1.1	19.41		
20	1.1	19.41		
21	1.1	19.50		
22	3.1	18.77		
23	3.1	18.78		
24	3.1	23.78		
25	1.0	24.75		
26	0.0	25.24		
27	0.0	25.25		
28	0.0	25.39	100.0	HOSE
150	11.3	9.01	16.8	0.1
151	11.9	9.02		
152	11.3	10.28	18.0	6.9
153	11.8	10.67		
154	11.3	16.17	22.5	34.1
155	11.8	16.89		
156	11.3	20.27	25.2	50.1
157	11.8	21.20		
158	11.3	28.32	29.8	77.4
159	11.7	29.66		
160	11.6	45.71		
161	11.6	62.85		
162	11.3	12.21	19.6	16.5
163	11.9	12.31		
164	11.3	13.88	20.9	24.2
165	11.8	14.47		
166	11.3	21.70	26.1	55.3
167	11.8	22.70		
168	11.3	27.11	29.2	73.5
169	11.7	28.39		
170	11.7	39.51		
171	11.6	51.45		
172	11.6	64.18		
173	11.3	13.25	20.4	21.3
174	11.9	13.37		
175	11.3	15.05	21.7	29.3
176	11.8	15.70		
177	11.3	23.48	27.1	61.5
178	11.8	24.58		
179	11.3	29.32	30.3	80.5
180	11.7	30.72		
181	11.6	42.69		

NODE	ELEVATION FT.	PRESSURE PSI	DISCHARGE GPM	WASTAGE %
182	11.6	55.53		
183	11.5	69.11		
184	11.5	79.65		
185	11.5	90.84		
186	10.2	96.19		
187	10.0	123.43		
188	9.2	125.94		
189	9.2	132.50		
190	3.9	136.29		
191	2.2	144.39		
192	2.2	146.51		
193	2.2	151.22		

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Dry 3.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	27	QN=0.0		L=167.0		PT=25.25	K=0.00
1			D=8.390	F=62.6	0.001	PF=0.14	V=1.78
				FT=GT		PE=0.00	C=140.00
	28	QP=307.5		LT=229.6		PT=25.39	Pv=0.02
	26	QN=0.0		L=19.0		PT=25.24	K=0.00
2			D=8.044	F=0.0	0.001	PF=0.01	V=1.94
				FT=0		PE=0.00	C=150.00
	27	QP=307.5		LT=19.0		PT=25.25	Pv=0.03
	25	QN=0.0		L=25.0		PT=24.75	K=0.00
3			D=8.044	F=53.5	0.001	PF=0.05	V=1.94
				FT=EE		PE=0.43	C=150.00
	26	QP=307.5		LT=78.5		PT=25.24	Pv=0.03
	24	QN=0.0		L=2.6		PT=23.78	K=0.00
4			D=6.065	F=14.0	0.004	PF=0.07	V=3.42
				FT=E		PE=0.91	C=120.00
	25	QP=307.5		LT=16.6		PT=24.75	Pv=0.08
	23	QN=0.0		L=4.7		PT=18.78	K=0.00
5			D=6.065	F=0.0	0.000	PF=5.00	V=3.42
				FT=F,5		PE=0.00	C=120.00
	24	QP=307.5		LT=4.7		PT=23.78	Pv=0.08
	22	QN=0.0		L=2.4		PT=18.77	K=0.00
6			D=6.065	F=0.0	0.004	PF=0.01	V=3.42
				FT=0		PE=0.00	C=120.00
	23	QP=307.5		LT=2.4		PT=18.78	Pv=0.08
	21	QN=0.0		L=2.0		PT=19.50	K=0.00
7			D=6.065	F=30.0	0.004	PF=0.13	V=3.42
				FT=T		PE=-0.87	C=120.00
	22	QP=307.5		LT=32.0		PT=18.77	Pv=0.08
	20	QN=0.0		L=5.9		PT=19.41	K=0.00
8			D=6.065	F=17.0	0.004	PF=0.09	V=3.42
				FT=GE		PE=0.00	C=120.00
	21	QP=307.5		LT=22.9		PT=19.50	Pv=0.08
	19	QN=0.0		L=0.8		PT=19.41	K=0.00
9			D=6.065	F=0.0	0.004	PF=0.00	V=3.42
				FT=0		PE=0.00	C=120.00
	20	QP=307.5		LT=0.8		PT=19.41	Pv=0.08
	19					PT=152.00	
10		PUMP RATE132.6 PSI @ 307.6 GPM POWER 23.8 HP					
	18					PT=19.41	

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Dry 3.mdb

PE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	17	QN=0.0		L=0.8		PT=152.00	K=0.00
1			D=6.065	F=0.0	0.004	PF=0.00	V=3.42
				FT=0		PE=0.00	C=120.00
	18	QP=307.5		LT=0.8		PT=152.00	Pv=0.08
	16	QN=0.0		L=3.3		PT=151.94	K=0.00
2			D=6.065	F=13.0	0.004	PF=0.07	V=3.42
				FT=C		PE=0.00	C=120.00
	17	QP=307.5		LT=16.3		PT=152.00	Pv=0.08
	15	QN=0.0		L=2.1		PT=151.81	K=0.00
3			D=6.065	F=30.0	0.004	PF=0.13	V=3.42
				FT=T		PE=0.00	C=120.00
	16	QP=307.5		LT=32.1		PT=151.94	Pv=0.08
	150	QN=16.8		L=0.6		PT=9.01	K=5.60
4			D=1.080	F=1.6	0.115	PF=0.26	V=5.89
				FT=E		PE=-0.25	C=100.00
	151	QP=16.8		LT=2.2		PT=9.02	Pv=0.23
	152	QN=18.0		L=0.5		PT=10.28	K=5.60
15			D=1.080	F=4.1	0.130	PF=0.60	V=6.29
				FT=T		PE=-0.22	C=100.00
	153	QP=18.0		LT=4.6		PT=10.67	Pv=0.27
	154	QN=22.5		L=0.5		PT=16.17	K=5.60
16			D=1.080	F=4.1	0.198	PF=0.91	V=7.89
				FT=T		PE=-0.20	C=100.00
	155	QP=22.5		LT=4.6		PT=16.89	Pv=0.42
	156	QN=25.2		L=0.4		PT=20.27	K=5.60
17			D=1.080	F=4.1	0.244	PF=1.11	V=8.83
				FT=T		PE=-0.18	C=100.00
	157	QP=25.2		LT=4.6		PT=21.20	Pv=0.52
	158	QN=29.8		L=0.4		PT=28.32	K=5.60
18			D=1.080	F=4.1	0.333	PF=1.50	V=10.44
				FT=T		PE=-0.16	C=100.00
	159	QP=29.8		LT=4.5		PT=29.66	Pv=0.73
	162	QN=19.6		L=0.5		PT=12.21	K=5.60
19			D=1.080	F=1.6	0.153	PF=0.33	V=6.85
				FT=E		PE=-0.23	C=100.00
	163	QP=19.6		LT=2.2		PT=12.31	Pv=0.32
	164	QN=20.9		L=0.5		PT=13.88	K=5.60
20			D=1.080	F=4.1	0.172	PF=0.80	V=7.31
				FT=T		PE=-0.22	C=100.00
	165	QP=20.9		LT=4.6		PT=14.47	Pv=0.36

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Dry 3.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	166	QN=26.1		L=0.4		PT=21.70	K=5.60
21			D=1.080	F=4.1	0.260	PF=1.19	V=9.14
				FT=T		PE=-0.18	C=100.00
	167	QP=26.1		LT=4.6		PT=22.70	Pv=0.56
	168	QN=29.2		L=0.4		PT=27.11	K=5.60
22			D=1.080	F=4.1	0.320	PF=1.44	V=10.21
				FT=T		PE=-0.16	C=100.00
	169	QP=29.2		LT=4.5		PT=28.39	Pv=0.70
	173	QN=20.4		L=0.5		PT=13.25	K=5.60
23			D=1.080	F=1.6	0.165	PF=0.36	V=7.14
				FT=E		PE=-0.23	C=100.00
	174	QP=20.4		LT=2.2		PT=13.37	Pv=0.34
	175	QN=21.7		L=0.5		PT=15.05	K=5.60
24			D=1.080	F=4.1	0.185	PF=0.86	V=7.61
				FT=T		PE=-0.22	C=100.00
	176	QP=21.7		LT=4.6		PT=15.70	Pv=0.39
	177	QN=27.1		L=0.4		PT=23.48	K=5.60
25			D=1.080	F=4.1	0.280	PF=1.28	V=9.50
				FT=T		PE=-0.18	C=100.00
	178	QP=27.1		LT=4.6		PT=24.58	Pv=0.61
	179	QN=30.3		L=0.3		PT=29.32	K=5.60
26			D=1.080	F=4.1	0.344	PF=1.54	V=10.62
				FT=T		PE=-0.14	C=100.00
	180	QP=30.3		LT=4.5		PT=30.72	Pv=0.76
	151	QN=0.0		L=14.0		PT=9.02	K=0.00
27			D=1.080	F=0.0	0.115	PF=1.61	V=5.89
				FT=0		PE=0.04	C=100.00
	153	QP=16.8		LT=14.0		PT=10.67	Pv=0.23
	153	QN=0.0		L=14.0		PT=10.67	K=0.00
28			D=1.080	F=0.0	0.443	PF=6.20	V=12.18
				FT=0		PE=0.02	C=100.00
	155	QP=34.8		LT=14.0		PT=16.89	Pv=1.00
	155	QN=0.0		L=14.0		PT=16.89	K=0.00
29			D=1.408	F=0.0	0.307	PF=4.30	V=11.80
				FT=0		PE=0.02	C=100.00
	157	QP=57.3		LT=14.0		PT=21.20	Pv=0.94
	157	QN=0.0		L=14.0		PT=21.20	K=0.00
30			D=1.408	F=0.0	0.603	PF=8.44	V=17.00
				FT=0		PE=0.02	C=100.00
	159	QP=82.5		LT=14.0		PT=29.66	Pv=1.94

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Dry 3.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	159	QN=0.0		L=15.0		PT=29.66	K=0.00
31			D=1.408	F=0.0	1.067	PF=16.01	V=23.14
				FT=0		PE=0.04	C=100.00
	160	QP=112.3		LT=15.0		PT=45.71	Pv=3.60
	160	QN=0.0		L=11.3		PT=45.71	K=0.00
32			D=1.408	F=4.7	1.067	PF=17.13	V=23.14
				FT=T		PE=0.02	C=100.00
	161	QP=112.3		LT=16.0		PT=62.85	Pv=3.60
	163	QN=0.0		L=14.0		PT=12.31	K=0.00
33			D=1.080	F=0.0	0.153	PF=2.14	V=6.85
				FT=0		PE=0.02	C=100.00
	165	QP=19.6		LT=14.0		PT=14.47	Pv=0.32
	165	QN=0.0		L=14.0		PT=14.47	K=0.00
34			D=1.080	F=0.0	0.586	PF=8.20	V=14.16
				FT=0		PE=0.04	C=100.00
	167	QP=40.4		LT=14.0		PT=22.70	Pv=1.35
	167	QN=0.0		L=14.0		PT=22.70	K=0.00
35			D=1.408	F=0.0	0.405	PF=5.67	V=13.71
				FT=0		PE=0.02	C=100.00
	169	QP=66.5		LT=14.0		PT=28.39	Pv=1.26
	169	QN=0.0		L=14.0		PT=28.39	K=0.00
36			D=1.408	F=0.0	0.793	PF=11.11	V=19.71
				FT=0		PE=0.02	C=100.00
	170	QP=95.7		LT=14.0		PT=39.51	Pv=2.62
	170	QN=0.0		L=15.0		PT=39.51	K=0.00
37			D=1.408	F=0.0	0.793	PF=11.90	V=19.71
				FT=0		PE=0.04	C=100.00
	171	QP=95.7		LT=15.0		PT=51.45	Pv=2.62
	171	QN=0.0		L=11.3		PT=51.45	K=0.00
38			D=1.408	F=4.7	0.793	PF=12.73	V=19.71
				FT=T		PE=0.00	C=100.00
	172	QP=95.7		LT=16.0		PT=64.18	Pv=2.62
	174	QN=0.0		L=14.0		PT=13.37	K=0.00
39			D=1.080	F=0.0	0.165	PF=2.31	V=7.14
				FT=0		PE=0.02	C=100.00
	176	QP=20.4		LT=14.0		PT=15.70	Pv=0.34
	176	QN=0.0		L=14.0		PT=15.70	K=0.00
40			D=1.080	F=0.0	0.632	PF=8.84	V=14.75
				FT=0		PE=0.04	C=100.00
	178	QP=42.1		LT=14.0		PT=24.58	Pv=1.46

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Dry 3.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	178	QN=0.0		L=14.0		PT=24.58	K=0.00
41			D=1.408	F=0.0	0.436	PF=6.10	V=14.27
				FT=0		PE=0.04	C=100.00
	180	QP=69.2		LT=14.0		PT=30.72	Pv=1.37
	180	QN=0.0		L=14.0		PT=30.72	K=0.00
42			D=1.408	F=0.0	0.854	PF=11.96	V=20.52
				FT=0		PE=0.02	C=100.00
	181	QP=99.6		LT=14.0		PT=42.69	Pv=2.83
	181	QN=0.0		L=15.0		PT=42.69	K=0.00
43			D=1.408	F=0.0	0.854	PF=12.81	V=20.52
				FT=0		PE=0.02	C=100.00
	182	QP=99.6		LT=15.0		PT=55.53	Pv=2.83
	182	QN=0.0		L=11.2		PT=55.53	K=0.00
44			D=1.408	F=4.7	0.854	PF=13.56	V=20.52
				FT=T		PE=0.02	C=100.00
	183	QP=99.6		LT=15.9		PT=69.11	Pv=2.83
	183	QN=0.0		L=13.5		PT=69.11	K=0.00
45			D=2.203	F=0.0	0.779	PF=10.52	V=25.89
				FT=0		PE=0.02	C=100.00
	184	QP=307.5		LT=13.5		PT=79.65	Pv=4.51
	184	QN=0.0		L=9.5		PT=79.65	K=0.00
46			D=2.203	F=4.9	0.779	PF=11.19	V=25.89
				FT=E		PE=0.00	C=100.00
	185	QP=307.5		LT=14.4		PT=90.84	Pv=4.51
	185	QN=0.0		L=1.3		PT=90.84	K=0.00
47			D=2.203	F=4.9	0.779	PF=4.79	V=25.89
				FT=E		PE=0.56	C=100.00
	186	QP=307.5		LT=6.1		PT=96.19	Pv=4.51
	186	QN=0.0		L=87.8		PT=96.19	K=0.00
48			D=2.703	F=6.6	0.288	PF=27.17	V=17.20
				FT=E		PE=0.07	C=100.00
	187	QP=307.5		LT=94.4		PT=123.43	Pv=1.99
	187	QN=0.0		L=0.8		PT=123.43	K=0.00
49			D=2.703	F=6.6	0.288	PF=2.15	V=17.20
				FT=E		PE=0.36	C=100.00
	188	QP=307.5		LT=7.5		PT=125.94	Pv=1.99
	188	QN=0.0		L=16.1		PT=125.94	K=0.00
50			D=2.703	F=6.6	0.288	PF=6.54	V=17.20
				FT=E		PE=0.02	C=100.00
	189	QP=307.5		LT=22.7		PT=132.50	Pv=1.99

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Dry 3.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	189	QN=0.0		L=5.3		PT=132.50	K=0.00
51			D=2.703	F=0.0	0.288	PF=1.51	V=17.20
				FT=0		PE=2.27	C=100.00
	190	QP=307.5		LT=5.3		PT=136.29	Pv=1.99
	190	QN=0.0		L=20.0		PT=136.29	K=0.00
52			D=2.703	F=5.5	0.288	PF=7.34	V=17.20
				FT=D		PE=0.76	C=100.00
	191	QP=307.5		LT=25.5		PT=144.39	Pv=1.99
	191	QN=0.0		L=0.8		PT=144.39	K=0.00
53			D=2.703	F=6.6	0.288	PF=2.13	V=17.20
				FT=E		PE=0.00	C=100.00
	192	QP=307.5		LT=7.4		PT=146.51	Pv=1.99
	192	QN=0.0		L=3.0		PT=146.51	K=0.00
54			D=2.703	F=13.3	0.288	PF=4.71	V=17.20
				FT=T		PE=0.00	C=100.00
	193	QP=307.5		LT=16.3		PT=151.22	Pv=1.99
	193	QN=0.0		L=1.1		PT=151.22	K=0.00
55			D=6.065	F=21.4	0.006	PF=0.13	V=3.42
				FT=T		PE=0.46	C=100.00
	15	QP=307.5		LT=22.5		PT=151.81	Pv=0.08
	172	QN=0.0		L=13.0		PT=64.18	K=0.00
56			D=2.203	F=0.0	0.378	PF=4.91	V=17.51
				FT=0		PE=0.02	C=100.00
	183	QP=208.0		LT=13.0		PT=69.11	Pv=2.06
	161	QN=0.0		L=11.0		PT=62.85	K=0.00
57			D=2.203	F=0.0	0.121	PF=1.33	V=9.45
				FT=0		PE=0.00	C=100.00
	172	QP=112.3		LT=11.0		PT=64.18	Pv=0.60

SPRINKLER SYSTEM ANALYSIS (IMPERIAL)
CALCULATION #4

Contractor : CODE FIRE, LLC
Company Address:4896 Van Gordon Street, Wheat Ridge, CO 80033

DATE: 12.21.2007

JOB NAME : Medical Center of Aurora

ADDRESS : 1501 S Potomac, Aurora, CO

Description:REMOTE AREA #4

DESIGNER : DHolcombe

Authority : Aurora

CONTRACT #LO7013 REF. TO DRAWING #3 OF 8

HAZARD DESCRIPTION: LIGHT
*

CALCULATION CRITERIA:-
TOTAL AREA : 900.0 SQ.FT.
DENSITY : 0.100 USGPM/SQ.FT.
Max.AREA/SPRINKLER : 161.0 SQ.FT.
OF SPRINKLER : 8
Min. Safety : 0 PSI

SYSTEM REQUIREMENT:-

Node	System GPM	Hose GPM	Hydrant GPM	Total GPM	Pressure PSI
18	145.44	0.00	100.00	245.44	126.79

SOURCE INFORMATION:-

SUPPLY	STATIC PRESSURE	RESIDUAL PRESSURE	RESIDUAL FLOW
28	52.83 PSI	31.77 PSI	1500.0 GPM

FIRE PUMP RATING:

PUMP	PRESSURE	FLOW
10	135.00 PSI	750.0 GPM

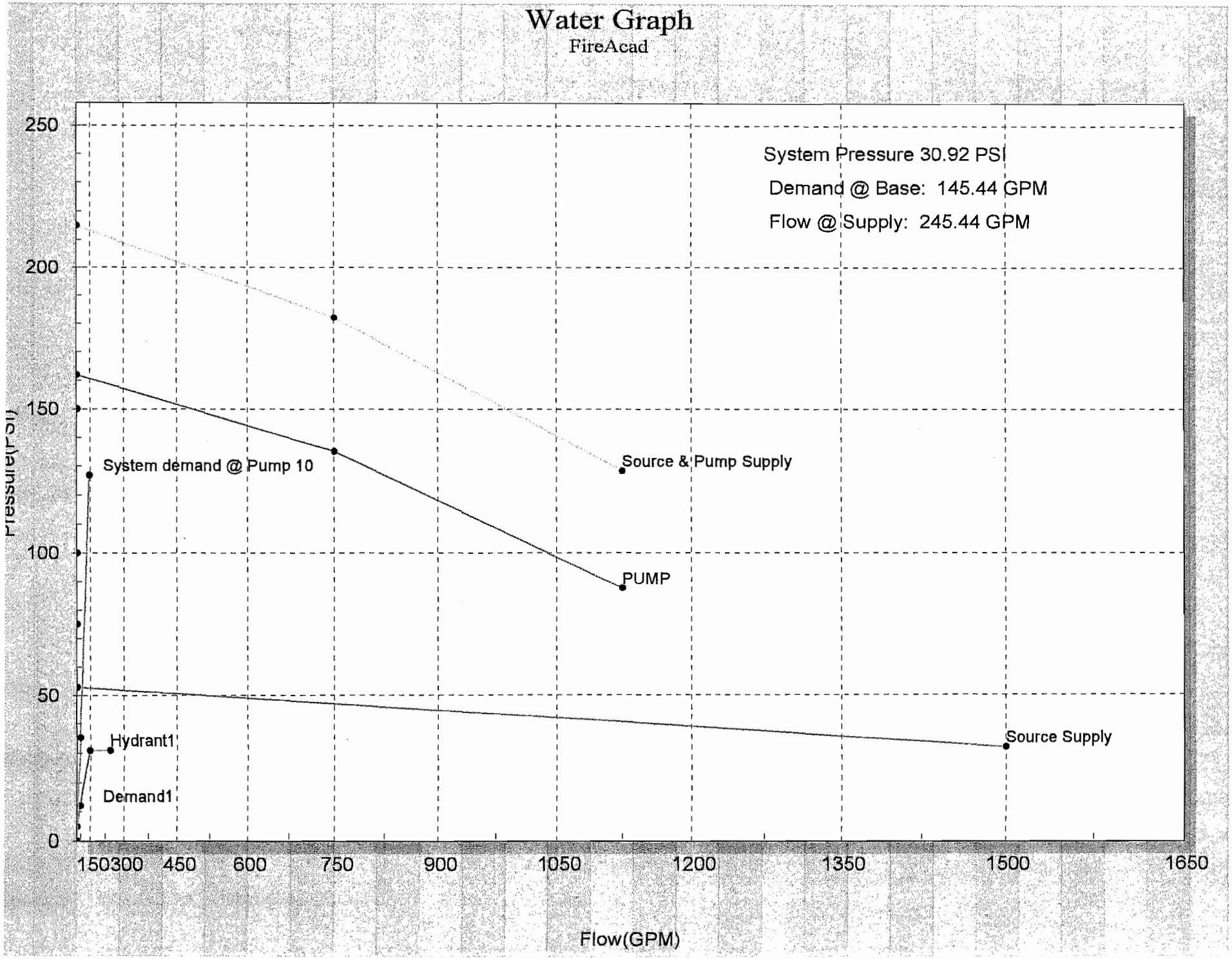
SPRINKLER K= 5.60
OVERHEAD PIPE C= 150/120
UNDERGROUND C= 140

TOTAL SAFETY = 21.17 PSI Below Supply

FILE: C:\fireacad\calc\MCOA Wet dining room 4.mdb

Water Graph

FireAcad



CODE FIRE, LLC

SPRINKLER SYSTEM ANALYSIS (IMPERIAL)

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Wet dining room 4.mdb

NODE	ELEVATION FT.	PRESSURE PSI	DISCHARGE GPM	WASTAGE %
14	1.1	126.68		
15	1.1	126.75		
16	1.1	126.78		
17	1.1	126.79		
18	1.1	126.79		
19	1.1	25.32		
20	1.1	25.32		
21	1.1	25.35		
22	3.1	24.51		
23	3.1	24.51		
24	3.1	29.52		
25	1.0	30.44		
26	0.0	30.88		
27	0.0	30.89		
28	0.0	30.92	100.0	HOSE
50	10.0	8.28	16.1	0.1
51	10.7	8.47		
52	10.0	9.02	16.8	4.5
53	10.7	9.54		
54	10.7	12.55		
55	10.0	12.00	19.4	20.5
56	10.7	12.03		
57	10.7	12.83		
58	10.0	8.91	16.7	3.8
59	10.7	8.86		
60	10.0	9.72	17.5	8.5
61	10.7	10.00		
62	10.7	14.31		
63	10.0	10.76	18.4	14.1
64	10.7	11.03		
65	10.0	11.71	19.2	19.0
66	10.7	12.39		
67	10.7	17.51		
68	10.7	58.35		
69	10.7	65.39		
70	10.7	73.61		
71	10.7	79.48		
72	10.7	83.29		
73	10.7	95.81		
74	10.7	104.21		
75	9.7	114.96		
76	9.7	118.45		
77	1.1	125.44		
78	1.1	126.54		
201	10.0	14.60	21.4	32.9
202	10.7	14.69		

NODE	ELEVATION FT.	PRESSURE PSI	DISCHARGE GPM	WASTAGE %
203	10.7	15.65		

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Wet dining room 4.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	27	QN=0.0		L=167.0		PT=30.89	K=0.00
1			D=8.390	F=62.6	0.000	PF=0.04	V=0.84
				FT=GT		PE=0.00	C=140.00
	28	QP=145.4		LT=229.6		PT=30.92	Pv=0.00
	26	QN=0.0		L=19.0		PT=30.88	K=0.00
2			D=8.044	F=0.0	0.000	PF=0.00	V=0.92
				FT=0		PE=0.00	C=150.00
	27	QP=145.4		LT=19.0		PT=30.89	Pv=0.01
	25	QN=0.0		L=25.0		PT=30.44	K=0.00
3			D=8.044	F=53.5	0.000	PF=0.01	V=0.92
				FT=EE		PE=0.43	C=150.00
	26	QP=145.4		LT=78.5		PT=30.88	Pv=0.01
	24	QN=0.0		L=2.6		PT=29.52	K=0.00
4			D=6.065	F=14.0	0.001	PF=0.02	V=1.62
				FT=E		PE=0.91	C=120.00
	25	QP=145.4		LT=16.6		PT=30.44	Pv=0.02
	23	QN=0.0		L=4.7		PT=24.51	K=0.00
5			D=6.065	F=0.0	0.000	PF=5.00	V=1.62
				FT=F,5		PE=0.00	C=120.00
	24	QP=145.4		LT=4.7		PT=29.52	Pv=0.02
	22	QN=0.0		L=2.4		PT=24.51	K=0.00
6			D=6.065	F=0.0	0.001	PF=0.00	V=1.62
				FT=0		PE=0.00	C=120.00
	23	QP=145.4		LT=2.4		PT=24.51	Pv=0.02
	21	QN=0.0		L=2.0		PT=25.35	K=0.00
7			D=6.065	F=30.0	0.001	PF=0.03	V=1.62
				FT=T		PE=-0.87	C=120.00
	22	QP=145.4		LT=32.0		PT=24.51	Pv=0.02
	20	QN=0.0		L=5.9		PT=25.32	K=0.00
8			D=6.065	F=17.0	0.001	PF=0.02	V=1.62
				FT=GE		PE=0.00	C=120.00
	21	QP=145.4		LT=22.9		PT=25.35	Pv=0.02
	19	QN=0.0		L=0.8		PT=25.32	K=0.00
9			D=6.065	F=0.0	0.001	PF=0.00	V=1.62
				FT=0		PE=0.00	C=120.00
	20	QP=145.4		LT=0.8		PT=25.32	Pv=0.02
	19					PT=126.79	
10		PUMP RATE101.5 PSI @ 145.4 GPM POWER 8.6 HP					
	18					PT=25.32	

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Wet dining room 4.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	17	QN=0.0		L=0.8		PT=126.79	K=0.00
11			D=6.065	F=0.0	0.001	PF=0.00	V=1.62
				FT=0		PE=0.00	C=120.00
	18	QP=145.4		LT=0.8		PT=126.79	Pv=0.02
	16	QN=0.0		L=3.3		PT=126.78	K=0.00
12			D=6.065	F=13.0	0.001	PF=0.02	V=1.62
				FT=C		PE=0.00	C=120.00
	17	QP=145.4		LT=16.3		PT=126.79	Pv=0.02
	15	QN=0.0		L=2.1		PT=126.75	K=0.00
13			D=6.065	F=30.0	0.001	PF=0.03	V=1.62
				FT=T		PE=0.00	C=120.00
	16	QP=145.4		LT=32.1		PT=126.78	Pv=0.02
	14	QN=0.0		L=1.1		PT=126.68	K=0.00
14			D=6.065	F=60.0	0.001	PF=0.06	V=1.62
				FT=2T		PE=0.00	C=120.00
	15	QP=145.4		LT=61.1		PT=126.75	Pv=0.02
	78	QN=0.0		L=1.1		PT=126.54	K=0.00
15			D=2.203	F=0.0	0.139	PF=0.15	V=12.24
				FT=0		PE=-0.01	C=120.00
	14	QP=145.4		LT=1.1		PT=126.68	Pv=1.01
	77	QN=0.0		L=1.1		PT=125.44	K=0.00
16			D=2.203	F=6.8	0.139	PF=1.10	V=12.24
				FT=E		PE=0.00	C=120.00
	78	QP=145.4		LT=7.9		PT=126.54	Pv=1.01
	76	QN=0.0		L=8.6		PT=118.45	K=0.00
17			D=2.203	F=15.0	0.139	PF=3.28	V=12.24
				FT=BE		PE=3.72	C=120.00
	77	QP=145.4		LT=23.6		PT=125.44	Pv=1.01
	75	QN=0.0		L=11.5		PT=114.96	K=0.00
18			D=2.203	F=13.6	0.139	PF=3.49	V=12.24
				FT=T		PE=0.00	C=120.00
	76	QP=145.4		LT=25.1		PT=118.45	Pv=1.01
	74	QN=0.0		L=67.4		PT=104.21	K=0.00
19			D=2.203	F=6.8	0.139	PF=10.32	V=12.24
				FT=E		PE=0.43	C=120.00
	75	QP=145.4		LT=74.2		PT=114.96	Pv=1.01
	73	QN=0.0		L=40.0		PT=95.81	K=0.00
20			D=2.203	F=20.4	0.139	PF=8.40	V=12.24
				FT=ET		PE=0.00	C=120.00
	74	QP=145.4		LT=60.4		PT=104.21	Pv=1.01

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Wet dining room 4.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	72	QN=0.0		L=83.3		PT=83.29	K=0.00
21			D=2.203	F=6.8	0.139	PF=12.52	V=12.24
				FT=E		PE=0.00	C=120.00
	73	QP=145.4		LT=90.1		PT=95.81	Pv=1.01
	71	QN=0.0		L=6.5		PT=79.48	K=0.00
22			D=1.639	F=0.0	0.587	PF=3.81	V=22.12
				FT=0		PE=0.00	C=120.00
	72	QP=145.4		LT=6.5		PT=83.29	Pv=3.29
	70	QN=0.0		L=10.0		PT=73.61	K=0.00
23			D=1.639	F=0.0	0.587	PF=5.87	V=22.12
				FT=0		PE=0.00	C=120.00
	71	QP=145.4		LT=10.0		PT=79.48	Pv=3.29
	69	QN=0.0		L=14.0		PT=65.39	K=0.00
24			D=1.639	F=0.0	0.587	PF=8.22	V=22.12
				FT=0		PE=0.00	C=120.00
	70	QP=145.4		LT=14.0		PT=73.61	Pv=3.29
	68	QN=0.0		L=12.0		PT=58.35	K=0.00
25			D=1.639	F=0.0	0.587	PF=7.04	V=22.12
				FT=0		PE=0.00	C=120.00
	69	QP=145.4		LT=12.0		PT=65.39	Pv=3.29
	67	QN=0.0		L=69.6		PT=17.51	K=0.00
26			D=1.639	F=0.0	0.587	PF=40.84	V=22.12
				FT=0		PE=0.00	C=120.00
	68	QP=145.4		LT=69.6		PT=58.35	Pv=3.29
	63	QN=18.4		L=1.2		PT=10.76	K=5.60
27			D=1.080	F=4.6	0.097	PF=0.56	V=6.43
				FT=2E		PE=-0.29	C=120.00
	64	QP=18.4		LT=5.8		PT=11.03	Pv=0.28
	65	QN=19.2		L=1.2		PT=11.71	K=5.60
28			D=1.080	F=8.1	0.105	PF=0.97	V=6.71
				FT=ET		PE=-0.29	C=120.00
	66	QP=19.2		LT=9.3		PT=12.39	Pv=0.30
	64	QN=0.0		L=14.0		PT=11.03	K=0.00
29			D=1.080	F=0.0	0.097	PF=1.36	V=6.43
				FT=0		PE=0.00	C=120.00
	66	QP=18.4		LT=14.0		PT=12.39	Pv=0.28
	66	QN=0.0		L=8.3		PT=12.39	K=0.00
30			D=1.080	F=5.8	0.364	PF=5.12	V=13.15
				FT=T		PE=0.00	C=120.00
	67	QP=37.5		LT=14.1		PT=17.51	Pv=1.16

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Wet dining room 4.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	203	QN=0.0		L=5.5		PT=15.65	K=0.00
31			D=1.639	F=0.0	0.338	PF=1.86	V=16.41
				FT=0		PE=0.00	C=120.00
	67	QP=107.9		LT=5.5		PT=17.51	Pv=1.81
	201	QN=21.4		L=0.7		PT=14.60	K=5.60
32			D=1.080	F=2.3	0.129	PF=0.38	V=7.49
				FT=E		PE=-0.29	C=120.00
	202	QP=21.4		LT=3.0		PT=14.69	Pv=0.38
	202	QN=0.0		L=1.7		PT=14.69	K=0.00
33			D=1.080	F=5.8	0.129	PF=0.96	V=7.49
				FT=T		PE=0.00	C=120.00
	203	QP=21.4		LT=7.5		PT=15.65	Pv=0.38
	62	QN=0.0		L=6.0		PT=14.31	K=0.00
34			D=1.639	F=0.0	0.224	PF=1.35	V=13.16
				FT=0		PE=0.00	C=120.00
	203	QP=86.5		LT=6.0		PT=15.65	Pv=1.16
	58	QN=16.7		L=0.7		PT=8.91	K=5.60
35			D=1.080	F=2.3	0.081	PF=0.24	V=5.85
				FT=E		PE=-0.29	C=120.00
	59	QP=16.7		LT=3.0		PT=8.86	Pv=0.23
	60	QN=17.5		L=0.7		PT=9.72	K=5.60
36			D=1.080	F=5.8	0.088	PF=0.57	V=6.12
				FT=T		PE=-0.29	C=120.00
	61	QP=17.5		LT=6.5		PT=10.00	Pv=0.25
	59	QN=0.0		L=14.0		PT=8.86	K=0.00
37			D=1.080	F=0.0	0.081	PF=1.14	V=5.85
				FT=0		PE=0.00	C=120.00
	61	QP=16.7		LT=14.0		PT=10.00	Pv=0.23
	61	QN=0.0		L=8.3		PT=10.00	K=0.00
38			D=1.080	F=5.8	0.306	PF=4.30	V=11.97
				FT=T		PE=0.00	C=120.00
	62	QP=34.2		LT=14.1		PT=14.31	Pv=0.96
	57	QN=0.0		L=8.0		PT=12.83	K=0.00
39			D=1.639	F=8.7	0.088	PF=1.48	V=7.96
				FT=T		PE=0.00	C=120.00
	62	QP=52.3		LT=16.7		PT=14.31	Pv=0.43
	55	QN=19.4		L=0.7		PT=12.00	K=5.60
40			D=1.080	F=2.3	0.107	PF=0.32	V=6.79
				FT=E		PE=-0.29	C=120.00
	56	QP=19.4		LT=3.0		PT=12.03	Pv=0.31

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Wet dining room 4.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	56	QN=0.0		L=1.7		PT=12.03	K=0.00
41			D=1.080	F=5.8	0.107	PF=0.80	V=6.79
				FT=T		PE=0.00	C=120.00
	57	QP=19.4		LT=7.5		PT=12.83	Pv=0.31
	54	QN=0.0		L=3.0		PT=12.55	K=0.00
42			D=1.639	F=4.4	0.038	PF=0.28	V=5.01
				FT=E		PE=0.00	C=120.00
	57	QP=32.9		LT=7.4		PT=12.83	Pv=0.17
	50	QN=16.1		L=1.7		PT=8.28	K=5.60
43			D=1.080	F=4.6	0.076	PF=0.48	V=5.64
				FT=2E		PE=-0.29	C=120.00
	51	QP=16.1		LT=6.3		PT=8.47	Pv=0.21
	52	QN=16.8		L=1.7		PT=9.02	K=5.60
44			D=1.080	F=8.1	0.082	PF=0.80	V=5.89
				FT=ET		PE=-0.29	C=120.00
	53	QP=16.8		LT=9.8		PT=9.54	Pv=0.23
	51	QN=0.0		L=14.0		PT=8.47	K=0.00
45			D=1.080	F=0.0	0.076	PF=1.07	V=5.64
				FT=0		PE=0.00	C=120.00
	53	QP=16.1		LT=14.0		PT=9.54	Pv=0.21
	53	QN=0.0		L=8.3		PT=9.54	K=0.00
46			D=1.080	F=2.3	0.286	PF=3.02	V=11.53
				FT=E		PE=0.00	C=120.00
	54	QP=32.9		LT=10.6		PT=12.55	Pv=0.90

SPRINKLER SYSTEM ANALYSIS (IMPERIAL)
CALCULATION #5

Contractor : CODE FIRE, LLC
Company Address:4896 Van Gordon Street, Wheat Ridge, CO 80033

DATE: 12.21.2007

JOB NAME : Medical Center of Aurora

ADDRESS : 1501 S Potomac, Aurora, CO

Description:REMOTE AREA #5

DESIGNER : DHolcombe

Authority : Aurora

CONTRACT #LO7013 REF. TO DRAWING #3 OF 8

HAZARD DESCRIPTION: LIGHT
*

CALCULATION CRITERIA:-
TOTAL AREA : 945.0 SQ.FT.
DENSITY : 0.100 USGPM/SQ.FT.
Max.AREA/SPRINKLER : 165.0 SQ.FT.
OF SPRINKLER : 7
Min. Safety : 0 PSI

SYSTEM REQUIREMENT:-

Node	System GPM	Hose GPM	Hydrant GPM	Total GPM	Pressure PSI
18	143.03	0.00	100.00	243.03	87.26

SOURCE INFORMATION:-

SUPPLY	STATIC PRESSURE	RESIDUAL PRESSURE	RESIDUAL FLOW
28	52.83 PSI	31.77 PSI	1500.0 GPM

FIRE PUMP RATING:

PUMP	PRESSURE	FLOW
10	135.00 PSI	750.0 GPM

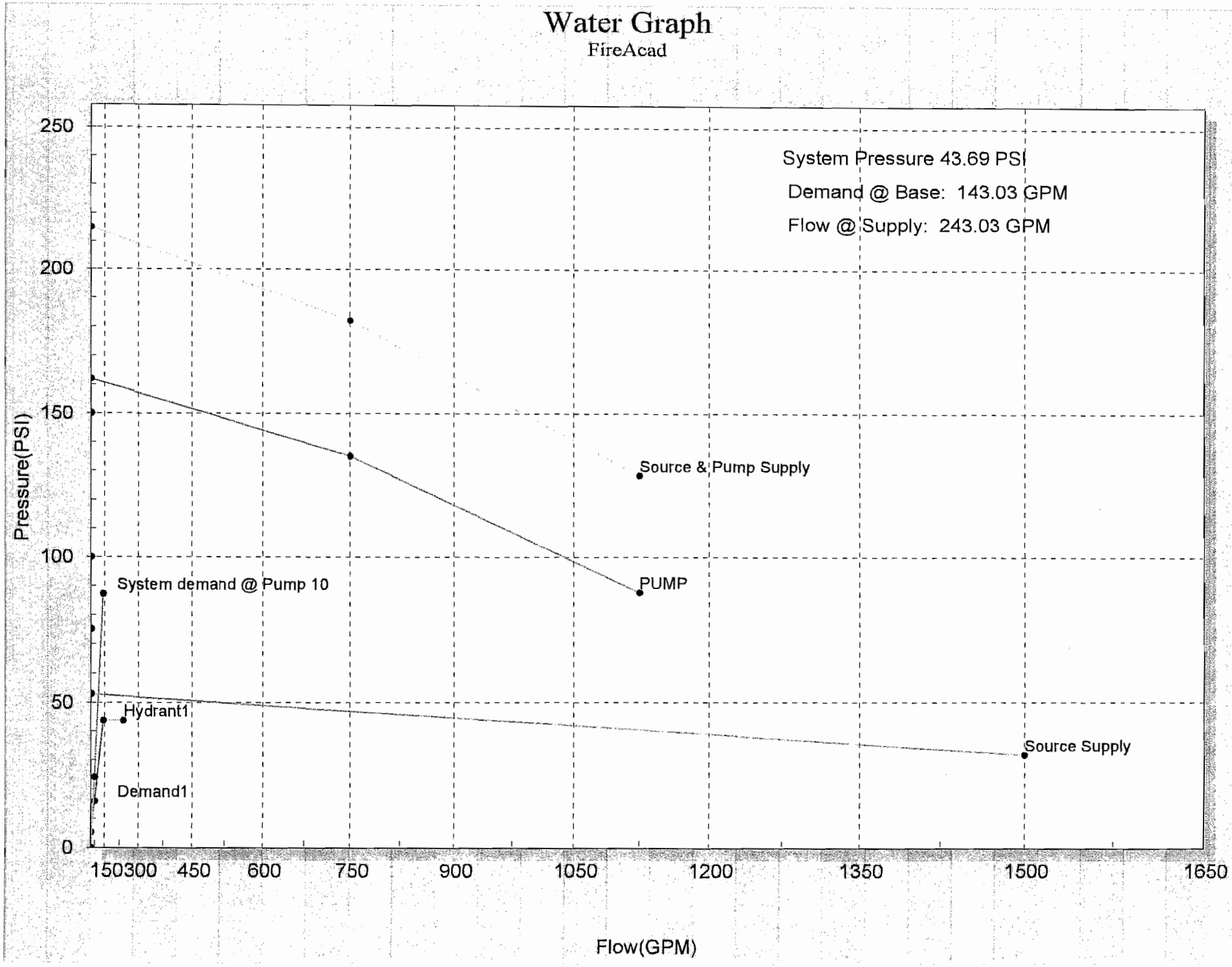
SPRINKLER K= 5.60
OVERHEAD PIPE C= 150/120
UNDERGROUND C= 140

TOTAL SAFETY = 8.42 PSI Below Supply

FILE: C:\fireacad\calc\MCOA Wet LOBBY 5.mdb

Water Graph

FireAcad



CODE FIRE, LLC

SPRINKLER SYSTEM ANALYSIS (IMPERIAL)

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Wet LOBBY 5.mdb

NODE	ELEVATION FT.	PRESSURE PSI	DISCHARGE GPM	WASTAGE %
14	1.1	87.15		
15	1.1	87.21		
16	1.1	87.24		
17	1.1	87.26		
18	1.1	87.26		
19	1.1	38.08		
20	1.1	38.09		
21	1.1	38.11		
22	3.1	37.27		
23	3.1	37.27		
24	3.1	42.28		
25	1.0	43.20		
	0.0	43.65		
27	0.0	43.65		
28	0.0	43.69	100.0	HOSE
69	10.7	36.34		
70	10.7	37.67		
71	10.7	41.26		
72	10.7	44.96		
73	10.7	57.09		
74	10.7	65.23		
75	9.7	75.67		
76	9.7	79.05		
77	1.1	85.95		
78	1.1	87.01		
80	10.0	8.69	16.5	0.1
81	11.9	8.20		
82	11.9	8.54		
83	10.0	9.45	17.2	4.3
84	11.9	8.98		
85	11.9	9.65		
86	10.0	13.73	20.7	25.7
87	11.9	13.83		
88	10.0	10.01	17.7	7.4
89	11.9	9.82		
90	10.0	10.37	18.0	9.3
91	11.9	9.84		
92	11.9	10.81		
93	10.0	14.44	21.3	29.0
94	11.9	14.50		
95	10.0	31.69	31.5	91.1
96	11.9	32.63		
97	11.9	34.23		
98	11.9	35.43		
99	11.9	40.15		
251	11.9	27.34		

NODE	ELEVATION FT.	PRESSURE PSI	DISCHARGE GPM	WASTAGE %
252	11.9	23.79		
253	11.9	36.35		

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Wet LOBBY 5.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	27	QN=0.0		L=167.0		PT=43.65	K=0.00
1			D=8.390	F=62.6	0.000	PF=0.03	V=0.83
				FT=GT		PE=0.00	C=140.00
	28	QP=143.0		LT=229.6		PT=43.69	Pv=0.00
	26	QN=0.0		L=19.0		PT=43.65	K=0.00
2			D=8.044	F=0.0	0.000	PF=0.00	V=0.90
				FT=0		PE=0.00	C=150.00
	27	QP=143.0		LT=19.0		PT=43.65	Pv=0.01
	25	QN=0.0		L=25.0		PT=43.20	K=0.00
3			D=8.044	F=53.5	0.000	PF=0.01	V=0.90
				FT=EE		PE=0.43	C=150.00
	26	QP=143.0		LT=78.5		PT=43.65	Pv=0.01
	24	QN=0.0		L=2.6		PT=42.28	K=0.00
4			D=6.065	F=14.0	0.001	PF=0.02	V=1.59
				FT=E		PE=0.91	C=120.00
	25	QP=143.0		LT=16.6		PT=43.20	Pv=0.02
	23	QN=0.0		L=4.7		PT=37.27	K=0.00
5			D=6.065	F=0.0	0.000	PF=5.00	V=1.59
				FT=F,5		PE=0.00	C=120.00
	24	QP=143.0		LT=4.7		PT=42.28	Pv=0.02
	22	QN=0.0		L=2.4		PT=37.27	K=0.00
6			D=6.065	F=0.0	0.001	PF=0.00	V=1.59
				FT=0		PE=0.00	C=120.00
	23	QP=143.0		LT=2.4		PT=37.27	Pv=0.02
	21	QN=0.0		L=2.0		PT=38.11	K=0.00
7			D=6.065	F=30.0	0.001	PF=0.03	V=1.59
				FT=T		PE=-0.87	C=120.00
	22	QP=143.0		LT=32.0		PT=37.27	Pv=0.02
	20	QN=0.0		L=5.9		PT=38.09	K=0.00
8			D=6.065	F=17.0	0.001	PF=0.02	V=1.59
				FT=GE		PE=0.00	C=120.00
	21	QP=143.0		LT=22.9		PT=38.11	Pv=0.02
	19	QN=0.0		L=0.8		PT=38.08	K=0.00
9			D=6.065	F=0.0	0.001	PF=0.00	V=1.59
				FT=0		PE=0.00	C=120.00
	20	QP=143.0		LT=0.8		PT=38.09	Pv=0.02
	19					PT=87.26	
10		PUMP RATE49.2 PSI @ 143.0 GPM POWER 4.1 HP					
	18					PT=38.08	

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Wet LOBBY 5.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	17	QN=0.0		L=0.8		PT=87.26	K=0.00
11			D=6.065	F=0.0	0.001	PF=0.00	V=1.59
				FT=0		PE=0.00	C=120.00
	18	QP=143.0		LT=0.8		PT=87.26	Pv=0.02
	16	QN=0.0		L=3.3		PT=87.24	K=0.00
12			D=6.065	F=13.0	0.001	PF=0.02	V=1.59
				FT=C		PE=0.00	C=120.00
	17	QP=143.0		LT=16.3		PT=87.26	Pv=0.02
	15	QN=0.0		L=2.1		PT=87.21	K=0.00
13			D=6.065	F=30.0	0.001	PF=0.03	V=1.59
				FT=T		PE=0.00	C=120.00
	16	QP=143.0		LT=32.1		PT=87.24	Pv=0.02
	14	QN=0.0		L=1.1		PT=87.15	K=0.00
14			D=6.065	F=60.0	0.001	PF=0.06	V=1.59
				FT=2T		PE=0.00	C=120.00
	15	QP=143.0		LT=61.1		PT=87.21	Pv=0.02
	78	QN=0.0		L=1.1		PT=87.01	K=0.00
15			D=2.203	F=0.0	0.135	PF=0.15	V=12.04
				FT=0		PE=-0.01	C=120.00
	14	QP=143.0		LT=1.1		PT=87.15	Pv=0.98
	77	QN=0.0		L=1.1		PT=85.95	K=0.00
16			D=2.203	F=6.8	0.135	PF=1.06	V=12.04
				FT=E		PE=0.00	C=120.00
	78	QP=143.0		LT=7.9		PT=87.01	Pv=0.98
	76	QN=0.0		L=8.6		PT=79.05	K=0.00
17			D=2.203	F=15.0	0.135	PF=3.18	V=12.04
				FT=BE		PE=3.72	C=120.00
	77	QP=143.0		LT=23.6		PT=85.95	Pv=0.98
	75	QN=0.0		L=11.5		PT=75.67	K=0.00
18			D=2.203	F=13.6	0.135	PF=3.38	V=12.04
				FT=T		PE=0.00	C=120.00
	76	QP=143.0		LT=25.1		PT=79.05	Pv=0.98
	74	QN=0.0		L=67.4		PT=65.23	K=0.00
19			D=2.203	F=6.8	0.135	PF=10.00	V=12.04
				FT=E		PE=0.43	C=120.00
	75	QP=143.0		LT=74.2		PT=75.67	Pv=0.98
	73	QN=0.0		L=40.0		PT=57.09	K=0.00
20			D=2.203	F=20.4	0.135	PF=8.14	V=12.04
				FT=ET		PE=0.00	C=120.00
	74	QP=143.0		LT=60.4		PT=65.23	Pv=0.98

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Wet LOBBY 5.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	72	QN=0.0		L=83.3		PT=44.96	K=0.00
21			D=2.203	F=6.8	0.135	PF=12.14	V=12.04
				FT=E		PE=0.00	C=120.00
	73	QP=143.0		LT=90.1		PT=57.09	Pv=0.98
	71	QN=0.0		L=6.5		PT=41.26	K=0.00
22			D=1.639	F=0.0	0.569	PF=3.70	V=21.75
				FT=0		PE=0.00	C=120.00
	72	QP=143.0		LT=6.5		PT=44.96	Pv=3.18
	70	QN=0.0		L=10.0		PT=37.67	K=0.00
23			D=1.639	F=0.0	0.359	PF=3.59	V=16.96
				FT=0		PE=0.00	C=120.00
	71	QP=111.5		LT=10.0		PT=41.26	Pv=1.93
	69	QN=0.0		L=14.0		PT=36.34	K=0.00
24			D=1.639	F=0.0	0.095	PF=1.33	V=8.28
				FT=0		PE=0.00	C=120.00
	70	QP=54.5		LT=14.0		PT=37.67	Pv=0.46
	80	QN=16.5		L=1.9		PT=8.69	K=5.60
25			D=1.080	F=2.3	0.080	PF=0.34	V=5.78
				FT=E		PE=-0.83	C=120.00
	81	QP=16.5		LT=4.2		PT=8.20	Pv=0.22
	81	QN=0.0		L=2.0		PT=8.20	K=0.00
26			D=1.080	F=2.3	0.080	PF=0.34	V=5.78
				FT=E		PE=0.00	C=120.00
	82	QP=16.5		LT=4.3		PT=8.54	Pv=0.22
	82	QN=0.0		L=14.0		PT=8.54	K=0.00
27			D=1.080	F=0.0	0.080	PF=1.11	V=5.78
				FT=0		PE=0.00	C=120.00
	85	QP=16.5		LT=14.0		PT=9.65	Pv=0.22
	83	QN=17.2		L=1.9		PT=9.45	K=5.60
28			D=1.080	F=2.3	0.086	PF=0.36	V=6.03
				FT=E		PE=-0.83	C=120.00
	84	QP=17.2		LT=4.2		PT=8.98	Pv=0.24
	84	QN=0.0		L=2.0		PT=8.98	K=0.00
29			D=1.080	F=5.8	0.086	PF=0.67	V=6.03
				FT=T		PE=0.00	C=120.00
	85	QP=17.2		LT=7.8		PT=9.65	Pv=0.24
	85	QN=0.0		L=14.0		PT=9.65	K=0.00
30			D=1.080	F=0.0	0.299	PF=4.18	V=11.81
				FT=0		PE=0.00	C=120.00
	87	QP=33.7		LT=14.0		PT=13.83	Pv=0.94

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Wet LOBBY 5.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	86	QN=20.7		L=1.9		PT=13.73	K=5.60
31			D=1.080	F=5.8	0.122	PF=0.94	V=7.27
				FT=T		PE=-0.83	C=120.00
	87	QP=20.7		LT=7.7		PT=13.83	Pv=0.36
	87	QN=0.0		L=14.0		PT=13.83	K=0.00
32			D=1.080	F=4.6	0.726	PF=13.50	V=19.08
				FT=2E		PE=0.00	C=120.00
	251	QP=54.5		LT=18.6		PT=27.34	Pv=2.45
	88	QN=17.7		L=2.4		PT=10.01	K=5.60
33			D=1.080	F=4.6	0.091	PF=0.64	V=6.20
				FT=2E		PE=-0.83	C=120.00
	89	QP=17.7		LT=7.0		PT=9.82	Pv=0.26
	89	QN=0.0		L=11.0		PT=9.82	K=0.00
34			D=1.080	F=0.0	0.091	PF=1.00	V=6.20
				FT=0		PE=0.00	C=120.00
	92	QP=17.7		LT=11.0		PT=10.81	Pv=0.26
	90	QN=18.0		L=0.9		PT=10.37	K=5.60
35			D=1.080	F=2.3	0.094	PF=0.30	V=6.32
				FT=E		PE=-0.83	C=120.00
	91	QP=18.0		LT=3.2		PT=9.84	Pv=0.27
	91	QN=0.0		L=4.6		PT=9.84	K=0.00
36			D=1.080	F=5.8	0.094	PF=0.97	V=6.32
				FT=T		PE=0.00	C=120.00
	92	QP=18.0		LT=10.4		PT=10.81	Pv=0.27
	92	QN=0.0		L=11.1		PT=10.81	K=0.00
37			D=1.080	F=0.0	0.333	PF=3.69	V=12.52
				FT=0		PE=0.00	C=120.00
	94	QP=35.7		LT=11.1		PT=14.50	Pv=1.05
	93	QN=21.3		L=2.4		PT=14.44	K=5.60
38			D=1.080	F=4.6	0.127	PF=0.89	V=7.45
				FT=2E		PE=-0.83	C=120.00
	94	QP=21.3		LT=7.0		PT=14.50	Pv=0.37
	94	QN=0.0		L=11.8		PT=14.50	K=0.00
39			D=1.080	F=0.0	0.790	PF=9.29	V=19.97
				FT=0		PE=0.00	C=120.00
	252	QP=57.0		LT=11.8		PT=23.79	Pv=2.68
	95	QN=31.5		L=0.9		PT=31.69	K=5.60
40			D=1.080	F=5.8	0.264	PF=1.77	V=11.04
				FT=T		PE=-0.83	C=120.00
	96	QP=31.5		LT=6.7		PT=32.63	Pv=0.82

JOB NAME: Medical Center of Aurora
FILE: C:\fireacad\calc\MCOA Wet LOBBY 5.mdb

PIPE No.	NODE No.	FLOW GPM	DIA. IN.	LENGTH FT.	FRICTION PSI/FT.	PRESSURE PSI	
	96	QN=0.0		L=14.1		PT=32.63	K=0.00
41			D=1.080	F=0.0	0.264	PF=3.71	V=11.04
				FT=0		PE=0.00	C=120.00
	253	QP=31.5		LT=14.1		PT=36.35	Pv=0.82
	97	QN=0.0		L=1.3		PT=34.23	K=0.00
42			D=1.408	F=6.6	0.200	PF=1.57	V=11.22
				FT=T		PE=0.54	C=120.00
	69	QP=54.5		LT=7.9		PT=36.34	Pv=0.85
	98	QN=0.0		L=1.3		PT=35.43	K=0.00
43			D=1.408	F=6.6	0.217	PF=1.71	V=11.75
				FT=T		PE=0.54	C=120.00
	70	QP=57.0		LT=7.9		PT=37.67	Pv=0.93
	99	QN=0.0		L=1.3		PT=40.15	K=0.00
44			D=1.408	F=6.6	0.072	PF=0.57	V=6.50
				FT=T		PE=0.54	C=120.00
	71	QP=31.5		LT=7.9		PT=41.26	Pv=0.28
	251	QN=0.0		L=31.3		PT=27.34	K=0.00
45			D=1.408	F=3.3	0.200	PF=6.89	V=11.22
				FT=E		PE=0.00	C=120.00
	97	QP=54.5		LT=34.6		PT=34.23	Pv=0.85
	252	QN=0.0		L=43.7		PT=23.79	K=0.00
46			D=1.408	F=9.9	0.217	PF=11.64	V=11.75
				FT=3E		PE=0.00	C=120.00
	98	QP=57.0		LT=53.6		PT=35.43	Pv=0.93
	253	QN=0.0		L=49.2		PT=36.35	K=0.00
47			D=1.408	F=3.3	0.072	PF=3.80	V=6.50
				FT=E		PE=0.00	C=120.00
	99	QP=31.5		LT=52.5		PT=40.15	Pv=0.28

LEGEND

S = Standard 45 degree elbow	QN = Normal flow discharge
E = Standard 90 degree elbow	QP = Flow; in; pipe
L = Long turn degree elbow	D = Pipe inside diameter
T = Standard tee	L = Pipe length
B = Butterfly valve	F = Fitting equivalence
G = Gate valve	FT = Fitting type
C = Check valve	LT = Total length
A = Alarm valve	PT = Total node pressure
D = Dry pipe valve	PF = Pressure friction loss
W = Deluge valve	PE = Pressure elevation loss
P = Pre-action valve	K = Sprinkler K-factor
F = Back flow preventer	V = Velocity
F,x = Constant pressure x in PSI for fitting F	C = C-factor
	PV = Velocity pressure

SIGNIFICANT HYDRAULICAL NOTES:

Maximum velocity of 21.75 FT/SEC at pipe 22
Most remote sprinkler @ node 80

AURORA®
Pentair Pump Group

Submittal Data For
FIRE PUMPS

NO. OF PRINTS	
	For Approval
	Final
	Reproducible

Sales Office: FIRE PUMP SYSTEMS LTD P.O. No. _____
Factory Order No.: _____ Service: FIRE PUMP SERVICE
Job: AURORA MEDICAL CENTER
Engineer: _____
Contractor: CODE FIRE LLC
Sold To: SAME P.O. No. _____
Reference: FP-1 FIRE PUMP

PUMP

Number of Units: 1 Pump Only: ☐
Model: 4-481-11D Rotation: RH ☒ LH ☐
Size: 4X5
GPM: 750
TDH: 311 FT. Connections:
RPM: 3600 ☐ Threaded
☒ Flanged

Construction: ☒ 125# ☐ 250#
☐ Standard Fitted
☒ Bronze Fitted
☐

Lubrication:
Case: C.I. ☒ Grease
Imp.: BRZ. ☐ Oil
Shaft: STL. Stuffing Box:
Sleeve: BRZ. ☒ Packing
Case Ring: BRZ. ☐ Lantern Ring
Imp. Ring: _____

MOTOR

HP: 100
Phase: 365TS
Hertz: 60
Volts: 460
RPM: 3600
Frame: 365TS

Enclosure:
☒ ODP
☐ TEFC
☐ X Proof

☐ Vertical
☒ Horizontal
☐ Part Winding
☐ Hi Efficiency

☒ Aurora To Furnish
☐ Others To Furnish
☒ Factory Choice

Mfg: _____

OPTIONS

Base:
☐ Steel Drip Rim
☒ Steel Form
☐ Fabricated Steel
☐ Cast Iron Ring Type

Coupling:
Mfg: FALK
Size: _____
☐ Spacer
☒ Guard

Test:
☒ Certified Performance
☐ Wit. Certified Performance
☐ Hydro
☐ _____

Note: Motor not mounted at factory on vertical units.

SPECIAL REQUIREMENTS:

CONTROLS, JOCKEY PUMP AND ACCESSORIES PER ATTACHED SHEETS.

CERTIFIED PRINT:
Section: 912 Page: 231 FT. Curve Number: PC173677
Special: _____ Maintenance Sent: _____
By: JRM Date: 12-21-07 Office: FIRE PUMP SYSTEMS LTD.

This order will not be processed for manufacturing until approval is received.
Prints are not to scale and are certified correct only for this order. All orders are subject to acceptance at Aurora Pump, North Aurora, Illinois.

AURORA FIRE PUMPS

SELECTION TABLES

ELECTRIC DRIVEN HORIZONTAL SPLIT CASE

750 GPM

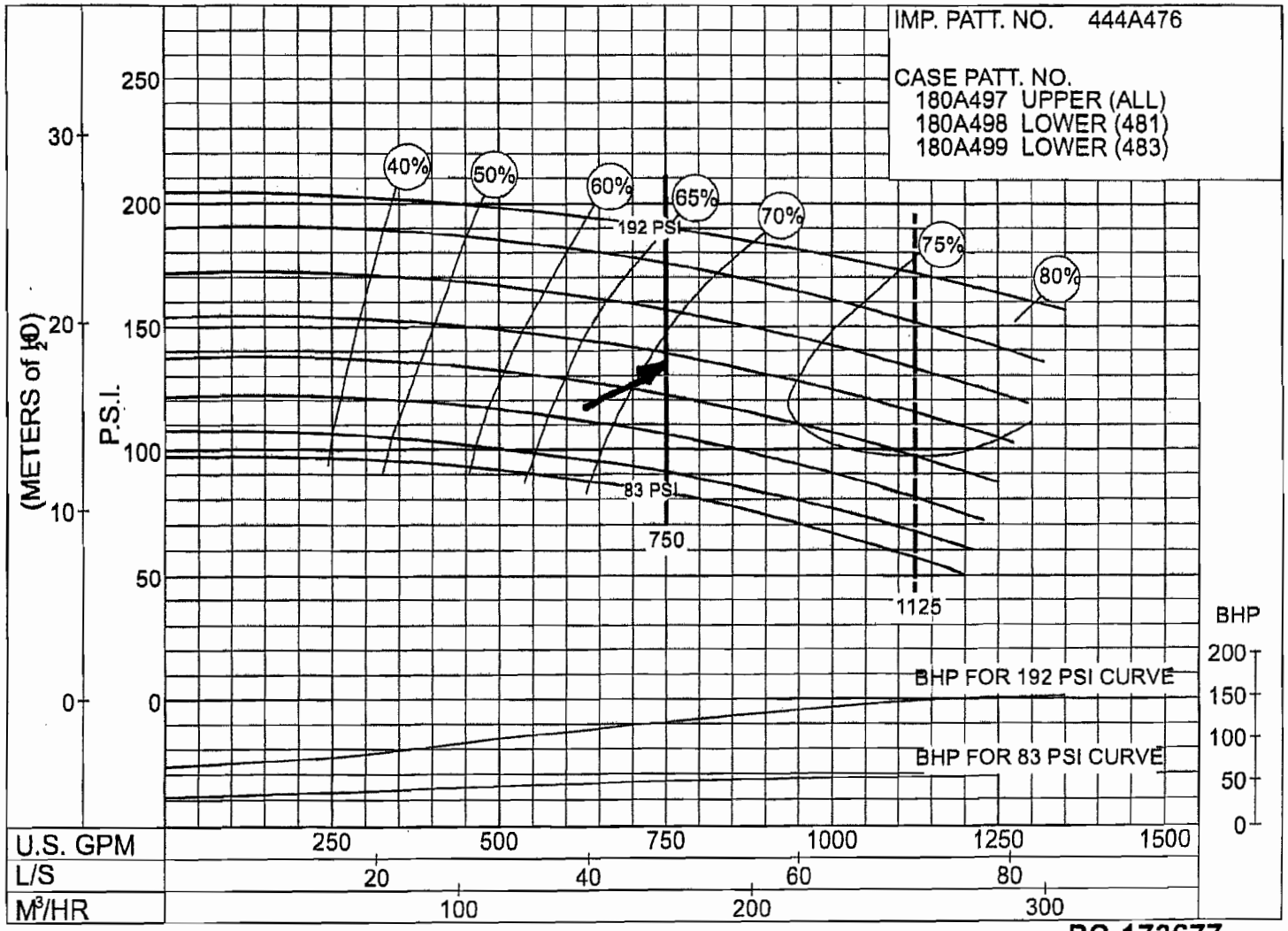
ELECTRIC DRIVEN						
RATED PRESSURE (PSI)	REQUIRED MOTOR HP RATING			PUMP SIZE & MODEL	MOTOR FRAME	UNIT WEIGHT
	UL LISTED & FM APPROVED	SPEED (RPM)	HORSE POWER (BHP)			
125	100	1770	100	4-492-18	404TS	1700
	125	1770	135	5-491-18A	405TS	2255
	100	3560	91	4-481-11D	365TS	1165
	100	3560	91	4-481-11C	365TS	1165
130	150	1770	147	5-491-18A	444TS	2525
	100	3560	94	4-481-11D	365TS	1165
	100	3560	94	4-481-11C	365TS	1165
135	150	1770	152	5-491-18A	444TS	2525
	100	3560	100	4-481-11D	365TS	1165
	100	3560	100	4-481-11C	365TS	1165
140	150	1770	161	5-491-18A	444TS	2525
	100	3560	105	4-481-11D	365TS	1165
	100	3560	105	4-481-11C	365TS	1165
145	125	1770	135	6-485-17A	405TS	2140
	100	3560	109	4-481-11D	365TS	1165
	100	3560	109	4-481-11C	365TS	1165
148	125	1770	139	6-485-17A	405TS	2140
	100	3560	109	4-481-11C	365TS	1165
150	125	1770	141	6-485-17A	405TS	2140
	100	3560	114	4-481-11D	365TS	1165
	100	3560	114	4-481-11C	365TS	1165
155	150	1770	147	6-485-17A	444TS	2310
	100	3550	110	4-491-11C	365TS	1696
	125	3560	116	4-481-11D	404TS	1385
	125	3560	121	4-481-11C	404TS	1385
160	150	1770	153	6-485-17A	444TS	2310
	125	3550	118	4-491-11C	404TS	1876
	125	3560	119	4-481-11D	404TS	1385
	125	3560	130	4-481-11C	404TS	1385
165	150	1770	159	6-485-17A	444TS	2310
	125	3550	120	4-491-11C	404TS	1876
	125	3560	123	4-481-11D	404TS	1385
	125	3560	135	4-481-11C	404TS	1385
170	150	1770	165	6-485-17A	444TS	2310
	125	3550	120	4-491-11C	404TS	1876
	125	3560	128	4-481-11D	404TS	1385
	125	3560	141	4-481-11C	404TS	1385
175	150	1770	172	6-485-17A	444TS	2310
	125	3550	132	4-491-11C	404TS	1876
	125	3560	128	4-481-11D	404TS	1385
	150	3560	147	4-481-11C	405TS	1500
180	200	1770	179	6-485-17A	445TS	2510
	125	3565	135	6-491-12A	404TS	1974
	125	3550	138	4-491-11C	404TS	1876
	125	3560	138	4-481-11D	404TS	1385
	150	3560	154	4-481-11C	405TS	1500

750 G.P.M. 912 SERIES

ELECTRIC MOTOR DRIVE

Supersedes Section 912 Page 409
Dated April 2000

SIZE : 4-481-11D/[redacted] **MODEL: 480** **IMPELLER : Enclosed** **R. P. M. : 3560**

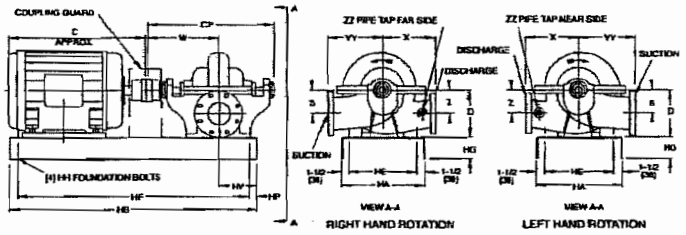


PC-173677

81 to 190 P.S.I.

AURORA MODEL 481 PUMPS

ON STANDARD STEEL BASE



STANDARD 125# SUCTION AND DISCHARGE FLANGES					OPTIONAL 125# SUCTION FLANGE, 250# DISCHARGE FLANGE			OPTIONAL 250# SUCTION AND DISCAHRGE FLANGES					MOTOR FRAME	21ST	25AT	25GT	28ATS	28AT	28GTS	28GT	32ATS	32AT	32GTS	32GT	36ATS	36AT	36GTS	36GT	40ATS	40AT	40STS	40ST	44ATS	44AT	44STS	44ST	44TTS	44TT
PUMP SIZE			SUCTION	POWER SERIES	D	S	W	X	Z	CP	HY	YY	ZZ	C; APPROC	18 (457)	21 (533)	23 (584)	22 (558)	24 (609)	24 (609)	25 (635)	25 (635)	26 (660)	26 (660)	28 (711)	29 (736)	29 (736)	28 (711)	30 (761)	30 (761)	33 (838)	32 (812)	35 (888)	34 (863)	38 (964)	36 (914)	40 (1015)	40 (1015)	44 (1117)
DISCH	MODEL	CASE BORE																																		
1-1/2	481	10B	3	2	8 (203)	4 (102)	13-1/2 (343)	9-3/4 (247)	4 (102)	20 (609)	5 (127)	10 (254)		BASE	5	7	7	9	9	9	9	10	11	10	11	11	11	11	12	-	-	-	-	-	-	-	-	
3	481	10	4		9* (228)	1-1/2 (114)	13-1/2 (343)	10 (254)	4-1/2 (114)	24 (609)	5 (127)	11 (279)		BASE	5	7	7	9	9	9	9	10	11	10	11	11	11	11	12	-	-	-	-	-	-	-	-	
4	481	11A 11C	5	3	10+ (254)	5 (127)	14-1/2 (368)	11-1/4 (286)	5 (124)	26 (660)	6 (152)	12-3/4 (324)		BASE	7	7	9	11	11	11	11	11	11	11	11	11	12	12	12	15	15	15	15	15	15	-		
4	481	11D	5		10+ (254)	5-1/2 (140)	14-1/2 -368	12 (305)	5 (124)	26 (660)	6 (152)	12-3/4 (324)		BASE	7	7	9	11	11	11	11	11	11	11	11	11	12	12	12	15	15	15	15	-	-	-	-	
4	481	15	6		11 (279)	5-1/2 (140)	14-1/2 (368)	13 (330)	5-1/2 (140)	26 (660)	6 (152)	14 (355)		BASE	-	7	9	11	11	11	11	11	11	11	11	11	12	12	12	15	15	15	15	-	-	-	-	
5	481	11B 11C	6	4	11** (279)	6-1/4 (159)	16 (406)	11-1/4 (286)	5-1/2 (140)	28-1/2 (723)	6 (152)	13-1/4 (336)	1-1/4	BASE	7	9	10	11	11	11	11	12	12	12	12	12	12	12	12	15	15	15	15	15	15	15	
5	481	15	6		12-1/2 (217)	6-1/4 (159)	16 (406)	13-1/4 (336)	6-1/4 (159)	26-1/2 (673)	6 (152)	15 (381)		BASE	7	9	10	11	11	11	11	12	12	12	12	12	12	12	12	15	15	15	15	15	15	15	15	
5	481	17	8		12-1/2 (217)	6-1/4 (159)	16 (406)	14 (355)	6-1/4 (159)	28-1/2 (723)	6 (152)	15 (381)		BASE	7	9	10	11	11	11	11	12	12	12	12	12	12	12	12	15	15	15	15	15	15	15	15	
6	481	11	8		12-1/2 (217)	8-5/8 (219)	16 (406)	11-3/4 (298)	6-1/4 (159)	28-1/2 (723)	6 (152)	14-1/2 (368)		BASE	7	9	10	11	11	11	11	12	12	12	12	12	12	12	12	15	15	15	15	15	15	15	15	
6	481	11HH	8	4A	16-1/2 (419)	8/5/08 (219)	18-1/2 (460)	10 (254)	8-5/8 (219)	32-7/8 (835)	8 (203)	15 (381)		BASE														13		15	-	15	-	16	-	16	-	16
6	481	14HH	8	5A	16-1/2 (419)	7-1/2 (191)	20-1/2 (519)	15 (381)	7-1/2 (191)	36-3/4 (933)	8 (203)	17 (431)		BASE															15	-	16	-	16	-	16	-	16
6	481	15B 15C	8	5	13-1/2 (343)	6-3/4 (171)	18 (457)	14-1/4 (368)	6-3/4 (171)	32 (812)	7 (178)	16-3/4 (425)		BASE		-	11	12	12	12	12	12	12	12	12	12	12	13	13	15	15	15	16	16	16	16	16	
6	481	18B 18C	8		14-3/4 (374)	8 (203	18 (457)	16 (406)	8 (203)	32 (812)	7 (178)	18 (457)		BASE		10	11	12	12	12	12	12	12	12	12	12	12	13	13	15	15	15	16	16	16	16	16	
6	481	20	8		14-3/4 (374)	8 (203)	18 (457)	15-3/4 (400)	8 (203)	32 (812)	7 (178)	18 (457)		BASE		10	11	12	12	12	12	12	12	12	12	12	12	13	13	15	15	15	16	16	16	16	16	
8	481	12	10		14-3/4 (374)	8 (203)	18 (457)	17 (431)	9 (228)	32 (812)	7 (178)	17-3/4 (450)		BASE		10	11	12	12	12	12	12	12	12	12	12	12	13	13	15	15	15	16	16	16	16	16	
8	481	17B	10		14-3/4 (374)	8 (203)	18 (457)	17 (431)	8 (203)	32 (812)	7 (178)	17-3/4 (450)	2	BASE		10	11	12	12	12	12	12	12	12	12	12	12	13	13	15	15	15	16	16	16	16	16	
8	481	21 21A	10	6B	18-1/2 (470)	9-1/2 (241)	21-7/8 (555)	18 (457)	9-1/2 (241)	38 (964)	11 (279)	21 (533)		BASE														14	14	16	16	16	16	16	16	16	17	
10	481	15C	12		25 (635)	13-1/2 (343)	21-7/8 (555)	17 (431)	13-1/2 (343)	38 (964)	11 (279)	20 (508)	1-1/4	BASE												14	14	14	14	16	16	16	16	16	16	16	17	
10	481	18	12		25 (635)	13-1/2 (343)	21-7/8 (555)	18 (457)	13-1/2 (343)	38 (964)	11 (279)	22 (558)	2	BASE														14	14	16	16	16	16	16	16	16	17	
10	481	18D	12	7A	25 (635)	12-1/4 (311)	24-1/4 (616)	20 (508)	12-1/4 (311)	43 (1092)	11-1/2 (292)	24 (610)		BASE																				16		16		17
12	481	18A	14	7	24 (609)	15 (381	25-1/4 (615)	18 (457)	15 (381)	44 (1117)	11 (279)	23 (584)		BASE																	16	16	16	16	17	17	17	

NOTES

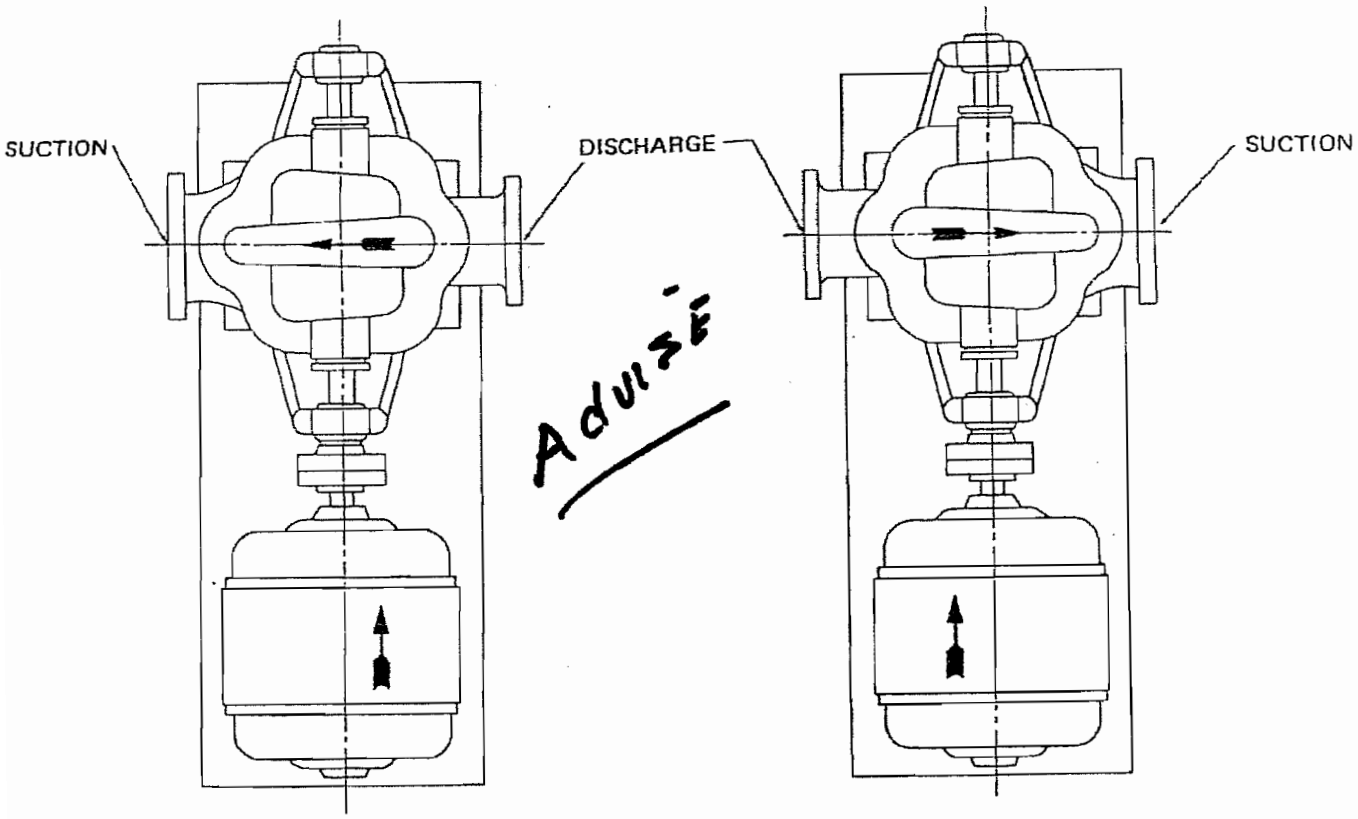
1. All dimensions are in inches.
2. Dimensions may vary ± 3/8".
3. Not for construction purposes unless certified.
4. Coupling gap may vary 1/8" thru 2-1/16".
5. Conduit box is shown in approximate location. Dimensions are not specified as they vary with each motor manufacturer.
6. Suction and discharge flanges are ANSI standard flat face.

- D is 9.0" when using frames 36ATS and 36STS.
* D is 10-1/2" when using frames 32ATS - 36STS.
** D is 12 when using frames 40ATS - 44STS.
*** Pump sizes 6-481-11HH & 6-481-14HH are furnished as standard with 125# suction flange & 250# discharge flange.
+D is 10-1/2" when using frames 40ATS - 40ST and D is 11 when using frames 44ATS - 44STS.

BASE	HA	HB	HE	HG	HH	HF	HP
5	12 (305)	38 (964)	9 (228)	3 (76)	1/2 (13)	17 (431)	20 (508)
7	13 (330)	42 (1066)	10 (254)	4 (101)	5/8 (15)	17 (431)	24 (609)
9	15 (381)	44 (1117)	12 (305)	3-3/8 (86)	5/8 (15)	19 (482)	24 (609)
10	18 (457)	44 (1117)	15 (381)	4 (101)	5/8 (15)	42 (1066)	1 (25)
11	18 (457)	48 (1219)	15 (381)	4 (101)	5/8 (15)	46 (1168)	1 (25)
12	18 (457)	54 (1371)	15 (381)	4 (101)	5/8 (15)	52 (1320)	1 (25)
13	18 (457)	60 (1524)	15 (381)	4 (101)	5/8 (15)	35 (888)	24 (609)
14	18 (457)	65 (1651)	15 (381)	4 (101)	5/8 (15)	40 (1015)	24 (609)
15	22 (558)	60 (1524)	19 (482)	4 (101)	5/8 (15)	58 (1473)	1 (25)
16	22 (558)	72 (1828)	19 (482)	4 (101)	5/8 (15)	70 (1778)	1 (25)
17	22 (558)	84 (2133)	19 (482)	4 (101)	5/8 (15)	82 (2082)	1 (25)

AURORA®
Pentair Water

ROTATION



COUNTER CLOCKWISE OR LEFT HAND ROTATION AS VIEWED FROM THIS END

CLOCK WISE OR RIGHT HAND ROTATION AS VIEWED FROM THIS END.

SITTING ON THE MOTOR LOOKING AT THE PUMP: IF THE SUCTION COMES IN ON THE LEFT SIDE IT IS A LEFT HAND PUMP. IF THE SUCTION COMES IN ON THE RIGHT HAND SIDE IT IS A RIGHT HAND PUMP.

NOTE: LEFT HAND DIESELS ARE NO LONGER AVAILABLE.

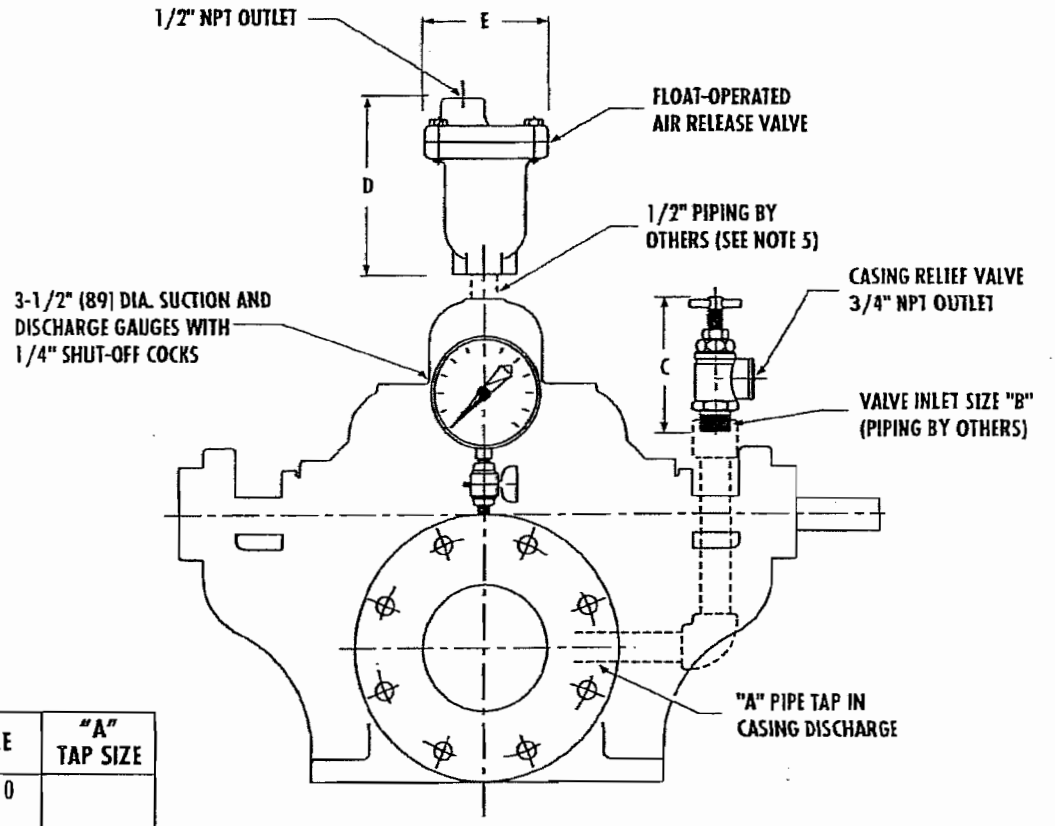
MCLEMORE PUMP INC.

PHONE 303 227-1002 FAX 303 227-1004

FIRE PUMP ACCESSORIES

- ☐ ECCENTRIC SUCTION REDUCER
  SIZE_____
  - ☐ 125 PSI
  - ☐ 250 PSI
- ☐ CONCENTRIC DISCHARGE INCREASER
  SIZE_____
  - ☐ 125 PSI
  - ☐ 250 PSI
- ☐ HOSE VALVE MANIFOLD
  SIZE_____
- ☐ 125 PSI
- ☐ 250 PSI
- ☐ _____ HOSE VALVES, 2-1/2" WITH CAPS AND CHAINS
- ☐ REDUCING TEE
  SIZE_____
  - ☐ 125 PSI
  - ☐ 250 PSI
- ☐ BALL DIRP VALVE
  SIZE_____
- ■ SUCTION AND DISCHARGE GAUGES, SIZE ¼"
- ■ ~~AUTOMATIC AIR RELASE VALVE, SIZE ½"~~
- ■ CASING RELIEF VALVE, SIZE ¾"
- ☐ MAIN RELIEF VALE
  SIZE_____
- ☐ KUNKLE – SPRING OPERATED TYPE
- ☐ CLAYTON-OCV – PILOT OPERATED TYPE
  - ☐ 125 PSI
  - ☐ 250 PSI
- ☐ WASTE CONE
  SIZE_____
  - ☐ ENCLOSED
  - ☐ OPEN
- ☐ SPLASH SHIELD
- ☐ FLOW METER
  MAKE_____ MODEL_____ SIZE_____
- ☐ BALL DRIP VALVE

NOT REQUIRED FOR IN-LINE PER NFPA 20



PIPE SIZE	"A" TAP SIZE
2-1/2-481-10 3-481-10 4-481-11 4-481-15 5-481-11 5-481-15 5-481-17 6-481-11 6-481-11HH 6-481-14HH 6-481-15 6-481-18 6-481-20 8-481-12 8-481-21 10-481-15 10-481-18D	1-1/4"
8-481-17 10-481-18 12-481-18	2"
ALL VERTICAL (483) MODELS	3/4"
ALL 2-STAGE (485) MODELS	1-1/4"
490 MODELS	3/4"

CASING RELIEF VALVE

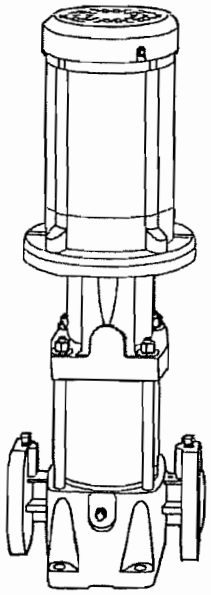
SYSTEM G.P.M.	VALVE INLET SIZE - "B"	"C"
250 500 750 1000 1250 1500 2000 2500	3/4"	4-1/2" (114)
3000 3500 4000	1"	5-1/2" (140)

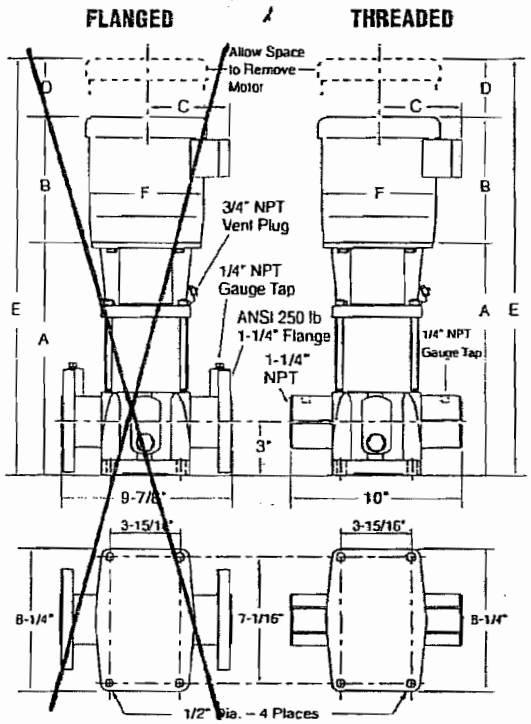
NOTES:
1. Dimensions are in inches (mm) and may vary ± 1/4" (6).
2. Accessories shown are shipped loose for field installtion.
3. Casing relief valve is to be adjusted to appropriate pressure upon field installtion
4. Casing relief valve is furnished on electric motor driven units only.
5. Two stage pumps require both vent taps piped to air release valve.
6. Suction guage range is 30"-0-150 PSI for suction pressures up to 75 PSI, or 30"-0-300 PSI for suction pressures over 75 PSI.
7. Discharge gauge range is 0-300-PSI for pumps with rated discharge pressures up to 150 PSI, or 0-600 PSI for pumps with rated discharge pressures over 150 PSI.

FLOAT OPERATED AIR RELEASE VALVE

SYSTEM OPERATING PRESSURE	"D"	"E"
UP TO 175 P.S.I.	5-7/8" (149)	3-3/4" (95)
OVER 175 P.S.I.	6-11/16" (170)	5-5/8" (143)

Cast Iron Construction





Technical Information

MINIMUM PUMPING RATES: 1.2 GPM

FLOW RANGE: 1.2 – 20 GPM

MINIMUM SUCTION PIPE SIZES:
1-1/4" Nominal Diameter, Schedule 40 Pipe

MAXIMUM INLET PRESSURE:
30/2 - 60 – 145 PSI
70 - 180 – 220 PSI

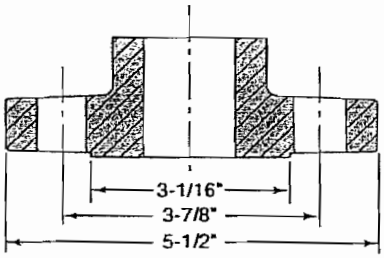
MAXIMUM AMBIENT TEMPERATURE: 104° F

LIQUID TEMPERATURE RANGE: +5° F to +250° F

MOTOR OPTIONS: TEFC or ODP

CONSTRUCTION MATERIALS: See Page 16.

1-1/4" ANSI. 250 lb. 4-Bolt Flange



Dimensions and Specifications – PVM 2 Series

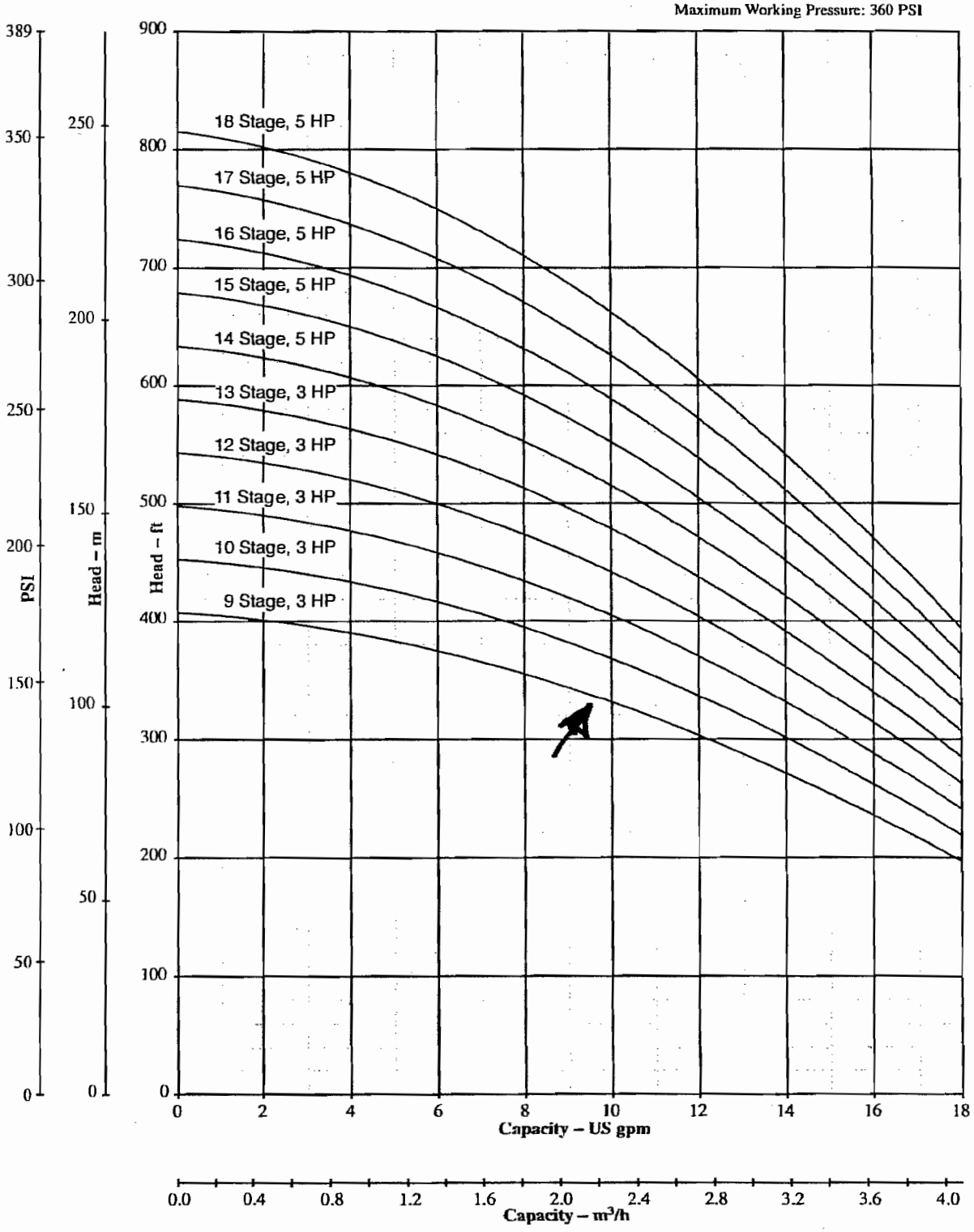
3 thru 5 HP

Model Number	HP	Motor S.F.	Ph	Volts	Frame Size	Disc. Size	Suc. Size	Dimension in Inches*						TEFC Wt.	ODP Wt.
								A	B	C	D	E	F		
PVM2-90	3	1.15	1	115/208-230	182TC	1-1/4	1-1/4	16	13-5/8	6 7/8	2-3/4	32-3/8	8-1/2	143	134
PVM2-90	3	1.15	3	208-230/460	182TC	1-1/4	1-1/4	16	12-1/4	6 7/8	2-7/8	31-1/8	8-1/2	124	124
PVM2-100	3	1.15	1	208-230	182TC	1-1/4	1-1/4	16-5/8	13-5/8	6-7/8	2-3/4	33-1/8	8-1/2	144	135
PVM2-100	3	1.15	3	208-230/460	182TC	1-1/4	1-1/4	16-5/8	12-1/4	6-7/8	2-7/8	31-7/8	8-1/2	125	125
PVM2-110	3	1.15	1	115/208-230	182TC	1-1/4	1-1/4	17-3/8	13 5/8	6 7/8	2-3/4	33-3/4	8-1/2	145	136
PVM2-110	3	1.15	3	208-230/460	182TC	1-1/4	1-1/4	17-3/8	12-1/4	6 7/8	2-7/8	32-1/2	8-1/2	126	126
PVM2-120	3	1.15	1	208-230	182TC	1-1/4	1-1/4	18-1/8	13-5/8	6-7/8	2-3/4	34-1/2	8-1/2	146	137
PVM2-120	3	1.15	3	208-230/460	182TC	1-1/4	1-1/4	18-1/8	12-1/4	6-7/8	2-7/8	33-1/4	8-1/2	127	127
PVM2-130	3	1.15	1	115/208-230	182TC	1-1/4	1-1/4	18-3/4	13-5/8	6 7/8	2-3/4	35-1/4	8-1/2	147	138
PVM2-130	3	1.15	3	208-230/460	182TC	1-1/4	1-1/4	18-3/4	12-1/4	6 7/8	2-7/8	34	8-1/2	128	128
PVM2-140	5	1.15	1	208-230	213TCZ	1-1/4	1-1/4	19-1/2	15-1/4	8	3-3/8	38-1/8	10-5/8	150	154
PVM2-140	5	1.15	3	208-230/460	184TC	1-1/4	1-1/4	19-1/2	13-5/8	6 7/8	2-7/8	36	8-1/2	150	150
PVM2-150	5	1.15	1	208-230	213TCZ	1-1/4	1-1/4	20-1/4	15-1/4	8	3-3/8	38-7/8	10-5/8	155	155
PVM2-150	5	1.15	3	208-230/460	184TC	1-1/4	1-1/4	20-1/4	13-5/8	6-7/8	2-7/8	36-3/4	8-1/2	151	151
PVM2-160	5	1.15	1	208-230	213TCZ	1-1/4	1-1/4	20-7/8	15-1/4	8	3-3/8	39-5/8	10-5/8	156	156
PVM2-160	5	1.15	3	208-230/460	184TC	1-1/4	1-1/4	20-7/8	13-5/8	6 7/8	2-7/8	37-1/2	8-1/2	152	152
PVM2-170	5	1.15	1	208-230	213TCZ	1-1/4	1-1/4	21-5/8	15-1/4	8	3-3/8	40-1/4	10-5/8	157	157
PVM2-170	5	1.15	3	208-230/460	184TC	1-1/4	1-1/4	21-5/8	13-5/8	6 7/8	2-7/8	38-1/8	8-1/2	153	153
PVM2-180	5	1.15	1	208-230	213TCZ	1-1/4	1-1/4	22-3/8	15-1/4	8	3-3/8	41	10-5/8	158	158
PVM2-180	5	1.15	3	208-230/460	184TC	1-1/4	1-1/4	22-3/8	13-5/8	6-7/8	2-7/8	38-7/8	8-1/2	154	154

* Measurements represent the largest number possible for each model using standard efficiency motors.
Weight may vary from published information.

Performance Curves – PVM (I/X) 2 Series

Nominal RPM: 3450
Based on Fresh Water @ 68 F.
Maximum Working Pressure: 360 PSI



ELECTRIC FIRE PUMP CONTROLLER

METRON

MODEL: MP300 COMBINATION MANUEL-AUTOMATIC, UL LISTED, FM APPROVED, NFPA 20 COMPLIANT AUTOMATIC FIRE PUMP CONTROLLER WITH RUN TIMER AND 10-300 PSI PRESSURE SWITCH. UL LISTED SERVICE ENTRANCE RATED

(ACROSS THE LINE) PART WINDING WYE-DELTA OPEN

WYE-DELTA CLOSED PRIMARY REDUCED VOLTAGE

LIMITED SERVICE AUTOTRANSFORMER SOLID STATE (SOFT START)

ENCLOSURE: (NEMA 2) NEMA 3R NEMA 12
NEMA 4X PAINTED NEMA 4X STAINLESS

WITHSTAND RATING: 14,000 AMPS 25,000 AMPS 50,000 AMPS
(100,000 AMPS) 150,000 AMPS 200,000 AMPS

TRANSFER SWITCH: INTEGRATED AUTOMATIC MODEL: MTS FOR USE WITH
(GENERATOR UNIT) SECOND UTILITY

OPTIONS: _____

ELECTRIC MOTOR: 100 HP 3600 RPM 3 PHASE 60 HERTZ 460 VOLTAGE

LOCKED ROTOR AMPS 725

JOCKEY PUMP CONTROLLER

MODEL: M15B WITH FUSIBLE DISCONNECT SWITCH, HP RATED FUSES, H-O-A SELECTOR, 15-240 STANDARD PRESSURE SWITCH, NEMA 2 ENCLOSURE, UL LISTED

JOCKEY PUMP: MOTOR 3 HP 3600 RPM 3 PHASE 60 HERTZ 460 VOLTAGE

OPTIONS: _____

REMOTE ALARM PANEL

MODEL: 1701C REMOTE ALARM PANEL. STANDARD ALARMS INCLUDE PUMP RUNNING, PUMP FAILURE, AND PHASE REVERSAL, NEMA 1 ENCLOSURE, 120v/60/1

REMOTE START BUTTON

Three Phase
PERFORMANCE
Dripproof

460 VOLTS, 60 HERTZ, NEMA DESIGN B, 40°C AMBIENT, NORMAL TORQUE

HP	Speed F.L. RPM	Frame	Nominal Efficiency① Full Load	¾ Load	½ Load	Nominal Power Factor③ Full Load	¾ Load	½ Load	Amps @ 460 Volts Full Load①	Locked Rotor②	Design Code Letter②	% Of Full Load Torque Locked Rotor②	Break-Down②
1/2	835	143T	64.0	62.0	55.0	54.7	46.2	36.7	1.5	10.0	R	140	225
3/4	1145	143T	74.0	72.0	66.0	59.1	51.9	40.4	1.6	12.5	P	175	275
	850	145T	72.0	70.0	64.0	51.3	43.6	34.2	2.1	12.5	P	135	220
1	1730	143T	77.0	74.0	68.0	68.4	59.6	47.3	1.8	15.0	N	275	300
	1140	145T	75.5	70.0	66.0	60.7	53.2	41.0	2.1	15.0	N	170	265
	850	182T	72.0	74.0	68.0	62.0	51.8	42.4	2.0	15.0	N	135	215
1-1/2	3480	143T	80.0	81.5	77.0	74.4	64.3	50.7	2.5	20.0	M	175	250
	1735	145T	80.0	81.5	80.0	74.0	59.9	46.4	2.4	20.0	M	250	280
	1150	182T	75.5	74.0	68.0	70.0	62.3	51.3	2.5	20.0	M	165	250
	865	184T	77.0	74.0	68.0	56.1	48.0	37.5	3.3	20.0	M	130	210
2	3470	145T	80.0	80.0	77.0	78.2	70.6	57.4	3.1	25.0	L	170	240
	1740	145T	81.5	80.0	77.0	75.5	64.8	52.5	3.1	25.0	L	235	270
	1145	184T	80.0	80.0	75.5	69.9	61.9	51.3	3.4	25.0	L	160	240
	870	213T	77.0	74.0	68.0	57.0	46.2	36.6	4.5	25.0	L	130	210
3	3475	145T	84.0	85.5	82.5	82.0	75.7	63.8	4.2	32.0	K	160	230
	1725	145T	84.0	85.5	84.0	81.0	76.2	62.1	4.3	32.0	K	215	250
	1730	182T	81.5	82.5	78.5	77.7	71.5	59.7	4.5	32.0	K	215	250
	1160	213T	82.5	81.5	77.0	69.1	62.0	49.7	4.8	32.0	K	155	230
	860	215T	78.5	77.0	75.5	57.5	49.9	38.0	6.1	32.0	K	130	205
5	3450	182T	82.5	81.5	80.0	81.9	75.3	61.6	7.0	46.0	J	150	215
	1740	184T	85.5	82.5	82.5	81.0	74.0	58.6	6.6	46.0	J	185	225
	1160	215T	85.5	85.5	84.0	75.4	68.2	56.1	7.35	46.0	J	150	215
7-1/2	3470	184T	86.5	87.5	86.5	91.1	86.2	79.7	9.0	63.5	H	140	200
	1750	213T	84.0	84.0	82.5	76.6	68.3	55.9	10.8	63.5	H	175	215
	1155	254T	84.0	85.5	84.0	74.0	68.8	54.0	11.2	63.5	H	150	205
10	3475	213T	82.5	81.5	78.5	86.6	83.3	73.3	12.5	81.0	H	135	200
	1745	215T	86.5	87.5	86.5	80.2	73.5	58.5	13.3	81.0	H	165	200
	1155	256T	85.5	87.0	86.0	81.0	79.8	66.0	13.7	81.0	H	150	200
15	3490	215T	86.5	88.5	88.5	86.1	80.7	70.4	18.7	116	G	130	200
	1745	254T	88.5	89.5	89.5	81.7	76.6	65.5	19.5	116	G	160	200
	1170	284T	87.5	88.0	87.0	80.0	76.0	66.5	20.0	116	G	140	200
20	3490	254T	88.5	87.5	86.5	89.3	88.2	79.5	23.7	145	G	130	200
	1755	256T	88.5	89.0	88.5	84.0	80.0	71.0	25.5	145	G	150	200
	1170	286T	89.5	90.0	88.5	80.0	76.0	66.0	26.0	145	G	135	200
25	3500	256T	87.5	88.5	88.5	90.0	88.5	83.0	30.0	182	G	130	200
	1760	284T	88.5	89.0	88.5	81.0	77.5	66.0	32.5	182	G	150	200
	1175	324T	89.5	90.5	90.0	81.5	78.0	68.0	32.0	182	G	135	200
30	3515	284T	86.5	86.5	85.0	87.0	84.0	76.0	37.0	217	G	130	200
	1760	286T	89.5	90.5	89.5	81.0	76.0	66.5	38.5	217	G	150	200
	1175	326T	90.2	90.0	89.0	80.0	76.0	66.0	39.0	217	G	135	200
40	3520	286T	89.5	89.0	88.5	89.0	87.0	81.0	47.5	290	G	125	200
	1765	324T	90.2	90.0	89.0	80.0	76.0	65.5	52.0	290	G	140	200
	1180	364T	89.5	90.5	90.0	81.5	78.5	70.5	52.0	290	G	135	200
50	3550	324T	89.5	89.5	88.0	85.5	82.5	74.5	61.0	362	G	125	200
	1760	326T	90.2	91.0	90.5	83.0	79.5	71.0	63.0	362	G	140	200
	1180	365T	90.2	90.5	90.0	80.5	77.0	67.5	64.0	362	G	135	200
60	3545	326T	89.5	90.0	89.0	88.0	86.0	80.5	71.0	435	G	120	200
	1775	364T	91.0	91.5	90.5	80.5	76.0	66.0	77.0	435	G	140	200
	1185	404T	91.7	91.5	90.5	81.0	77.0	68.0	76.0	435	G	135	200
75	3550	364T	90.2	91.0	91.0	85.0	82.0	75.0	92.0	542	G	120	200
	1775	365T	91.7	92.5	91.0	82.0	78.5	70.0	93.0	542	G	140	200
	1185	405T	92.4	93.0	92.5	82.0	79.0	69.0	92.0	542	G	135	200
100	3550	365T	91.7	92.0	92.5	85.5	83.5	78.0	119	725	G	105	200
	1775	404T	93.0	93.0	93.0	84.5	82.5	77.0	119	[illegible]	G	125	200
	1185	445T	93.0	93.5	93.0	83.5	80.5	72.5	121	725	G	125	200
125	3565	404T	92.4	92.5	92.0	90.0	89.0	85.0	140	907	G	100	200
	1780	405T	93.6	93.6	93.0	86.0	84.0	79.0	146	907	G	110	200
	1185	445T	93.6	93.5	93.0	84.5	82.0	74.5	148	907	G	125	200
150	3565	405T	93.0	93.5	93.0	90.5	89.5	86.0	167	1085	G	100	200
	1780	444T	94.5	94.5	94.0	83.0	80.0	72.0	179	1085	G	110	200
	1185	445T	93.0	93.0	92.5	85.0	83.0	76.0	177	1085	G	120	200
200	3565	444T	93.6	93.5	92.5	89.0	87.5	82.5	225	1450	G	100	200
	1780	445T	94.5	95.0	94.5	86.0	83.0	77.0	231	1450	G	100	200
250	3565	445T	93.6	93.5	92.5	90.5	90.0	86.5	275	1825	G	70	175
	1780	445T	95.0	95.4	95.0	86.0	84.0	78.5	290	1825	G	100	200

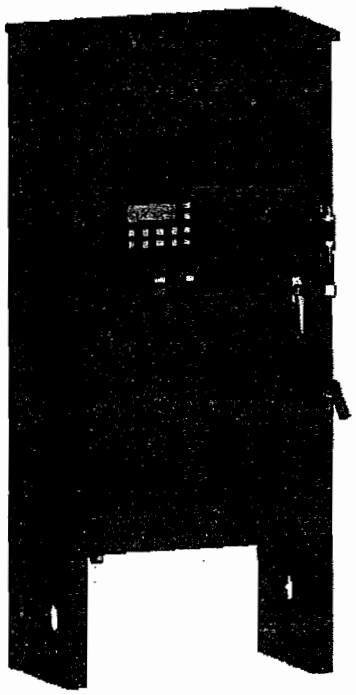
① To obtain Full Load Amps @ 230 V, multiply 460 V F.L.A. by 2; @ 575 V, multiply 460 V F.L.A. by 0.8; @ 200 V, multiply 460 V F.L.A. by 2.3. All values nominal.

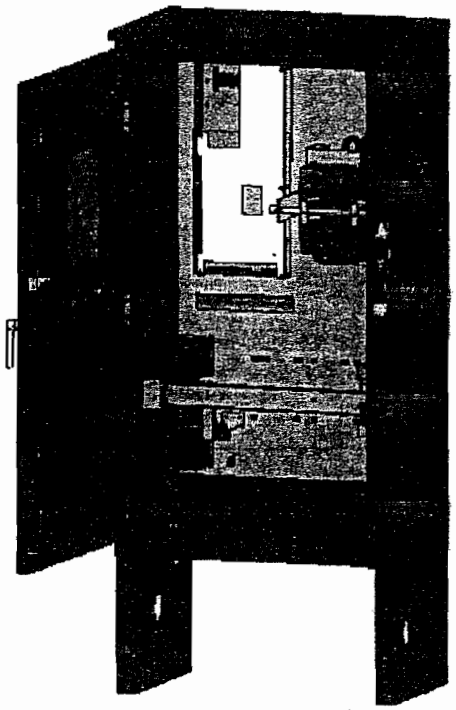
② NEMA values.

③ Nominal performance is the average tested performance for all motors of a particular rating.

Fire Pump Controller

For Electric Motor Driven Fire Pumps





MP300 Fire Pump Controller

Across The Line Type

Series MP300 - Combined Manual and Automatic

Metron Fire Pump Controllers conform to the latest requirements of Chapter 7, National Fire Protection Association Pamphlet 20, Standard for Centrifugal Fire Pumps as adopted by Underwriters Laboratories and Factory Mutual. They are withstand rated and listed by Underwriters' Laboratories and approved by Factory Mutual Research Corporation.

Sizes range from 15 to 600 horsepower, 200 to 600 volts, 60 Hz. These controllers are for use on Across-the-Line type installations.

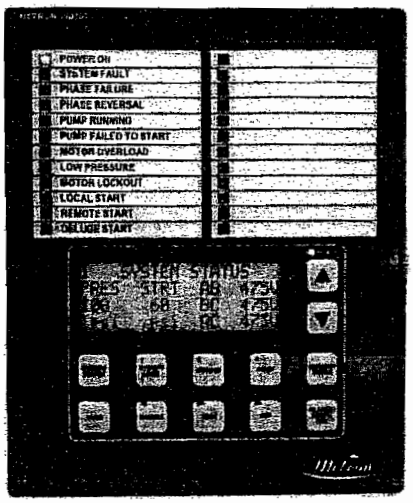
Only the highest quality components, all UL listed or UL recognized, are used throughout to assure the best possible reliability. The cabinet is fabricated of heavy gauge reinforced steel with drip-proof hood. All field wiring and service connections may be made from the front, allowing the controller to be mounted flush against a wall.

The controller is completely wired, assembled, and tested at the factory before shipment, and ready for immediate installation.

Standard and Optional Features

Standard Features

Operator Interface Device (OID) with LED Annunciator and Digital Display



- NEMA Type 2 drip proof metal freestanding enclosure
- AUTO, MANUAL, TEST, and OFF mode buttons illuminated with colored LED's for controller mode operation
- Operator Interface Device (OID) with 4 lines by 20 character display with large character backlit Liquid Crystal Display (LCD) capable of being read in both direct sunlight or dark lighting conditions
- 12 pushbuttons for easy screen navigation, system mode changes, alarm reset, and horn silencing
- Multicolored LED's for alarm and mode annunciation
- Removable labels to allow for easy field modification of additional alarms and/or language changes
- All controller settings are programmable through the OID. All features are enabled or disabled through the OID, no jumpers or external wires are needed allowing easy field modification
- The system status data shall be displayed on the OID. The displayed items include: System pressure, Phase to Phase (AB, BC, AC) voltage, Phase current (A, B, C), Current time and date, Number of starts, Total motor run hours, Time remaining on sequential motor start and motor stop timers.
- Audible horn with silence feature for silencable alarms
- Lamp test feature
- English or Spanish languages selectable through the OID
- Microprocessor based logic with real time/date clock capable of running a minimum of 14 days without AC power connected to controller
- Non-volatile flash memory, that does not require the use of a battery or external power. The flash memory permanently stores the continuous pressure log, event log, alarm log and all user changeable set points and system data.
- Input and output status LED's provide visual indication of each discrete input's or output's on/off status
- One RS232 Serial Port
- One USB 1.0 Port
- One RS485 Serial Port

Auxiliary alarms:
The controller includes as standard six (6) discrete auxiliary inputs, Nine (9) form 'C' auxiliary relay outputs. These auxiliary inputs and outputs are in addition to those mandated by NFPA 20. All auxiliary inputs, outputs, and OID LED's can be field programmed through the OID.

Nine (9).of the following auxiliary alarms can be programmed and recorded in the event/alarm logs and annunciated with an LED and output relay contact for conditions such as:

LOW PUMP ROOM TEMP
RESERVOIR LOW
RESERVOIR EMPTY
RESERVOIR HIGH
FLOW METER ON
RELIEF VALVE OPEN
LOW SUCTION PRESSURE
HIGH PUMP ROOM TEMPERATURE
LOW FIREWATER PRESSURE
LOW PURGE PRESSURE
LOW GEAR OIL PRESSURE
HIGH GEAR OIL TEMPERATURE
GAS DETECTION
HIGH VIBRATION
EMERGENCY POWER ON
PUMP ROOM DOOR OPEN

Data logging:
The controller includes three (3) separate data logs for storing system data that is readable through the OID or printed on the optional internal printer. The 3 data logs are as follows:

Pressure Log: The pressure log provides a continuous pressure record for a minimum of 7 days but it is capable of storing more than 30 days of data depending on the sample rate set by the customer. The pressure log samples shall be time and date stamped and stored in permanent non-volatile flash memory. The pressure log can be searched by each sample, by minute, or by hour.

Event Log: The event log will store more than 4000 events. These events can include, but is not limited to, any of the following events/alarms:

PUMP RUNNING
POWER AVAILABLE
PHASE REVERSAL
MOTOR OVERLOAD
REMOTE START

All photographs are typical and may not represent actual product supplied

LOCAL START
PUMP ON DEMAND
SYSTEM FAULT
AUTO MODE
MANUAL MODE
OFF MODE
PRESSURE TRANSDUCER FAULT
PUMP FAILED TO START
LOW INTAKE SHUTDOWN ALARM
SUPERVISORY POWER FAILURE
LOW PRESSURE
AUTO WEEKLY TEST START
UNDER FREQUENCY
OVER FREQUENCY
LOW ZONE / HIGH ZONE CONTACTS
HIGH DISCHARGE PRESSURE
NO LOAD CONDITION

Alarm Log: The Alarm Log is a separate subset of the event log which displays the last 10 alarms recorded in the system.

Each event or alarm recorded in the either event log or alarm logs has the following data recorded with the event/alarm providing an accurate record of events:

- Time and Date of Event or Alarm
- System Pressure
- Descriptive Text Message of the Event/Alarm
- Motor Running Status
- Phase to Phase Volts
- Phase Amps

Options

Option H: Space Heater
If the ambient atmosphere is especially damp, a space heater rated at 100 watts may be supplied to reduce moisture in the cabinet. A thermostat is supplied as standard with this option. A humidistat may be substituted if specified.

Option T: Weekly Test Start Solenoid
In some cases it may be desirable to have the electric motor run at a preset time each week for approximately 30 minutes. The controller includes a built in weekly test function. This option complements the standard function by simulating a loss of pressure. Simulation of pressure loss is accomplished by opening a solenoid valve, which reduces the system pressure below the starting pressure of the controller.

Option W: Omit Legs
For systems where the controller is mounted on a common skid with the pump and motor, the legs of the controller may be omitted, and 3" mounting channels or wall mounting brackets can be supplied. If specified, lifting eyes may also be supplied.

Option Y: Printer
Dot matrix printer for selective printing of pressure log, event log, and alarm log data as well as system configuration set point settings.

Enclosure
The following NEMA type enclosures are also available: 3R, 4, 4X (Painted Cold Rolled Steel), 4X (Unpainted 304 or 316 Stainless Steel), and 12

Model Number Designation

MP300 X - XXX - XXX X

- X: Withstand Rating: B – 22,000 (@575 VAC) 50,000 (200-480 VAC); C – 100,000 (200-480 VAC)
- XXX: Voltage Rating: 200-600 VAC
- XXX: Horsepower Rating: 15-600
- X: Option Designation(s)
- MP300: Model Type

Information required with order

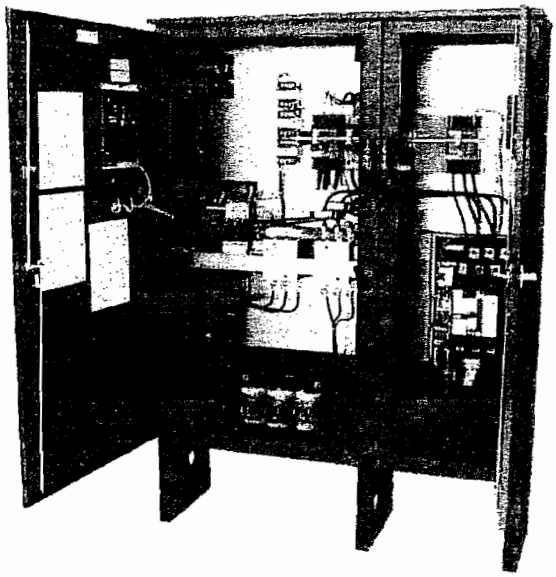
1) Model Type
2) Motor Horsepower
3) Line Voltage, phase and frequency
4) Options if any (complete description)

Standard Withstand Ratings: Model MP300

200-208 Volts	15-150 HP	100kA RMS Symmetrical
220-240 Volts	15-200 HP	100kA RMS Symmetrical
380-415 Volts	15-300 HP	100kA RMS Symmetrical
460-480 Volts	15-400 HP	100kA RMS Symmetrical
200-208 Volts	200-250 HP	50kA RMS Symmetrical
220-240 Volts	250-300 HP	50kA RMS Symmetrical
380-415 Volts	350-350 HP	50kA RMS Symmetrical
460-480 Volts	500-600 HP	50kA RMS Symmetrical
550-600 Volts	15-400 HP	22kA RMS Symmetrical

Power Transfer Switches
For Electric Motor Driven Fire Pumps





Series MTS
Automatic Transfer Switch

Metron MTS Automatic Transfer Switch provide operation of electric fire pump motors from a alternate source of power when the normal source fails. They may be used with any Metron electric fire pump controller—Across The Line, Primary Resistance, Part Winding, Wye-Delta, Auto Transformer or Solid State Reduced Voltage Types. These transfer switches are an integral part of the fire pump controller. They are factory assembled, shipped and installed as a part of the controller.

The combination fire pump controller/transfer switch is listed by Underwriters' Laboratories', Factory Mutual, and meets all the latest requirements of Section 7-8 of NFPA Standard for Installation of Centrifugal Fire Pumps.

The MTS Automatic Transfer Switch is a mechanically held double throw switch with a fast acting drive mechanism. Operating coils are momentarily energized from the source to which the load is being transferred. The switch is interlocked electrically and mechanically to prevent both services form feeding the load at the same time. The transfer switch is capable of manual (non-electrical) operation.

Undervoltage sensing devices are supplied which monitor each phase of normal service. When the voltage of any phase falls below the pre-set level the transfer switch automatically transfers to the alternate source. Voltage and frequency sensing devices are provided to monitor one phase of the alternate source and will inhibit transfer to the alternate source until adequate voltage and frequency are available.

The transfer switch provides a special circuit that de-energizes the motor control circuit five (5) second prior to transfer in either direction to prevent high current transients due to an out-of-phase condition between the motor and the source to which it is being connected.

A contact is provided to actuate the engine starting circuit when normal source fails. To prevent false starts, a time delay (factory set a 1/2 to 3 seconds) is provided between normal source failure and actuation of the engine start contact.

An isolation switch ahead of the alternate source input terminals of the transfer switch is provided. When the switch is opened, auxiliary contacts in the generator start circuit prevent starting if commanded to by the transfer switch. An additional auxiliary contact on the isolation switch is provided for remote annunciation of isolation switch position.

An adjustable time delay (0-30 min.) prevents restoration to normal service for a pre-set period of time to assure normal line stabilization.

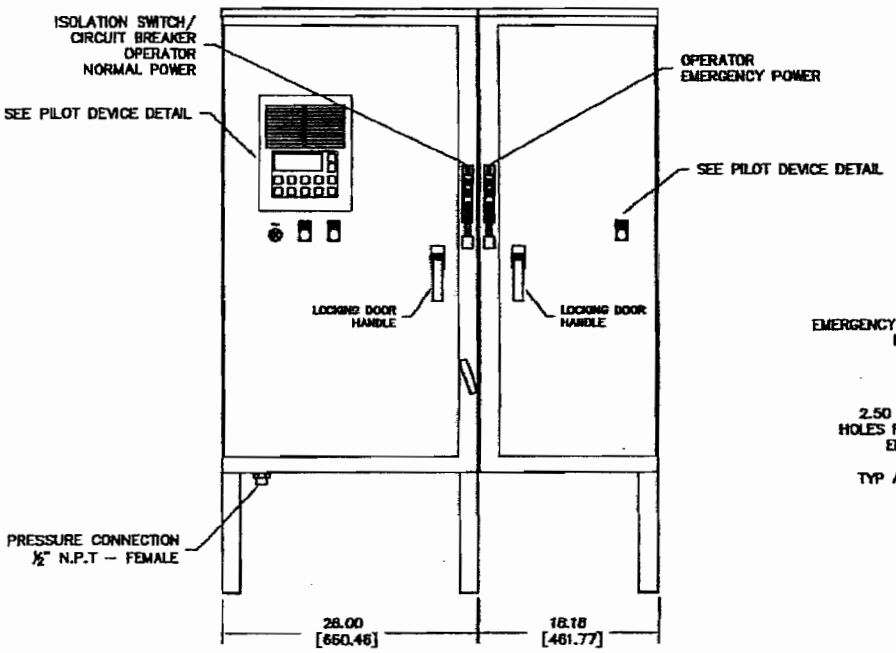
An auxiliary N.O. contact is provided for remote annunciation of transfer to emergency. This contact is operated by the transfer mechanism as a direct indication of switch position.

Pilot lights for indication of Switch in Normal position, Switch in Emergency position, and Emergency Isolation Switch in Off. Audible indication of Emergency Isolation Switch in Off is also included.

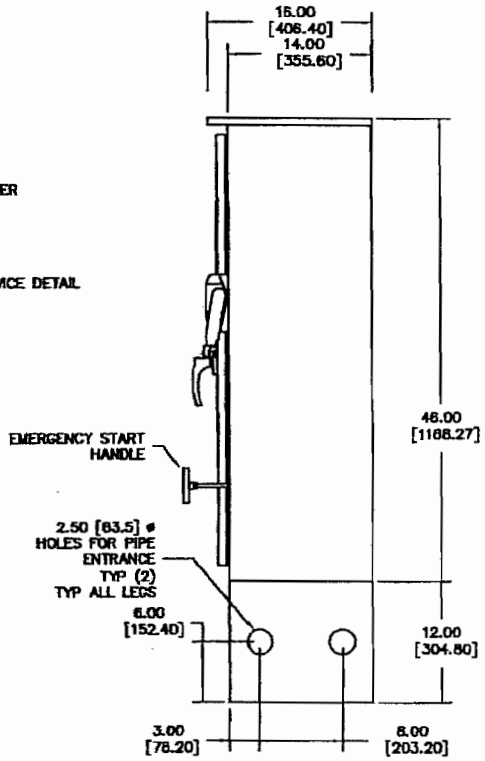
A test switch is also provided which simulates loss of normal power so that the transfer switch operation can be checked without interrupting normal service to the fire pump controller.

MP450 Fire Pump Controller with Automatic Transfer Switch

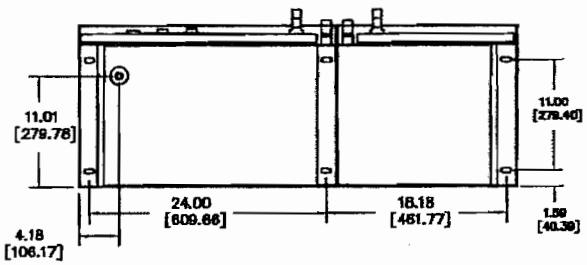
All photographs are typical and may not represent actual product supplied



FRONT VIEW

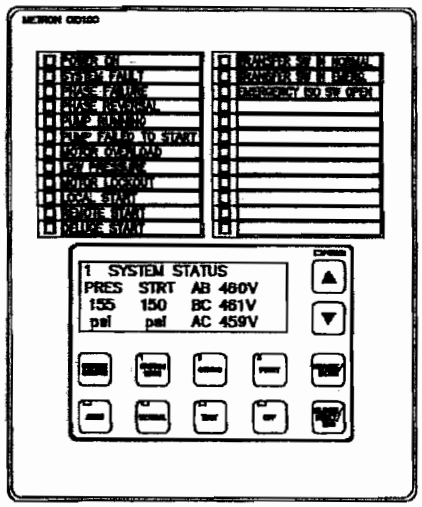


SIDE VIEW



BOTTOM VIEW

PILOT DEVICE DETAIL





LOCATED ON
TRANSFER SWITCH DOOR

VOLTAGE	HORSEPOWER
200V	15–60 HP.
208V	15–75 HP.
230V	15–75 HP.
380V	15–125 HP.
460V	15–150 HP.

NOTES:
1. ALL DIMENSIONS IN INCHES AND MILLIMETERS ([]).

	DRAWN		3–20–05
	CHECK		3–25–05
	APPD	JB	3–25–05

METRON, INC.
DENVER, CO.

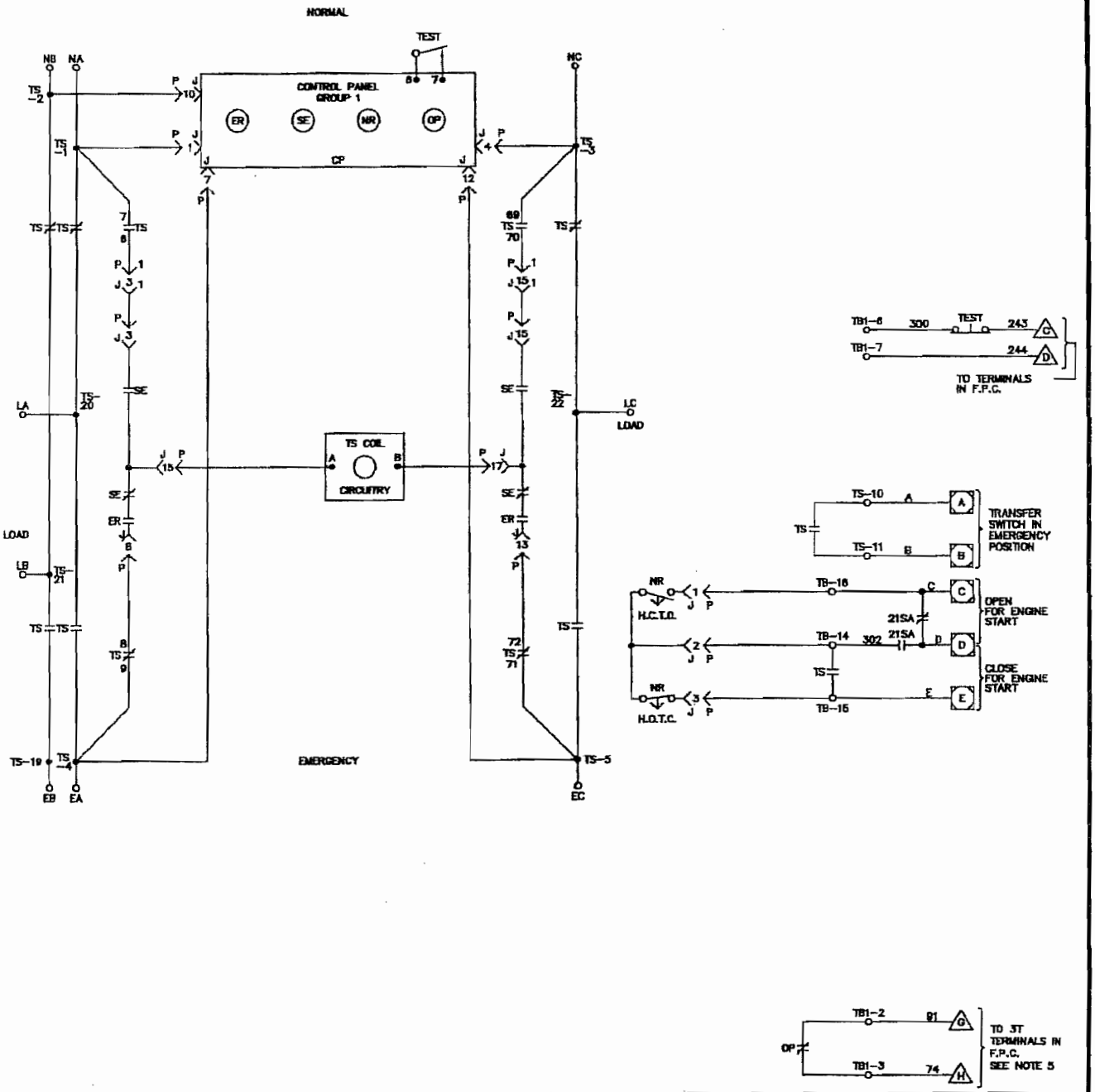
ENCLOSURE DIMENSIONS
MODEL MP300 WITH MTS
44"x46" CABINET

OPTIONS:
CD33989A

COMPONENTS	FUNCTION	LOCATION	CONTACTS
EA	EMER. SOURCE A PHASE TERMINAL	29	
EB	EMER. SOURCE B PHASE TERMINAL	29	
EC	EMER. SOURCE C PHASE TERMINAL	29	
ER	EMER. SOURCE TIMING RELAY	4	18
LA	LOAD OUTPUT A PHASE TERMINAL	15	
LB	LOAD OUTPUT B PHASE TERMINAL	21	
LC	LOAD OUTPUT C PHASE TERMINAL	15	
NA	NORMAL SOURCE A PHASE TERMINAL	2	
NB	NORMAL SOURCE B PHASE TERMINAL	2	
NC	NORMAL SOURCE C PHASE TERMINAL	2	
NR	NORMAL SOURCE TIMING RELAY	4	22,26
OP	LOAD DISCONNECT RELAY	4	30
SE	VOLTAGE SENSING TIMING RELAY	4	14,18
TS	TRANSFER SWITCH SOLENOID	17	1,3,8,19,23,24,25
21SA	ISO. SWITCH AUXILIARY		16,23,24

NOTES FOR FIELD WIRING:

1. ACC.31F—SELECTIVE LOAD DISCONNECT CONTROL CIRCUIT WITH (2) SETS OF DOUBLE THROW CONTACTS RATED 10AMPS, 480 VOLTS AC, TO OPERATE 3 SECONDS BEFORE TRANSFER OF THE A.T.S. AND RESETTING IMMEDIATELY AFTER TRANSFER.
2. TS TERMINALS, TERMINALS LOCATED ON TRANSFER SWITCH PANEL
3. CP TERMINALS, TERMINALS LOCATED ON CONTROL PANEL
4. AP TERMINALS, TERMINALS LOCATED ON ACCESSORY PANEL
5. △ DENOTES MATCH POINT ON FIRE PUMP CONTROLLER SCHEMATIC LOCATED INSIDE RIGHT DOOR.
6. ⬚ DENOTES TERMINALS ON TRANSFER SWITCH



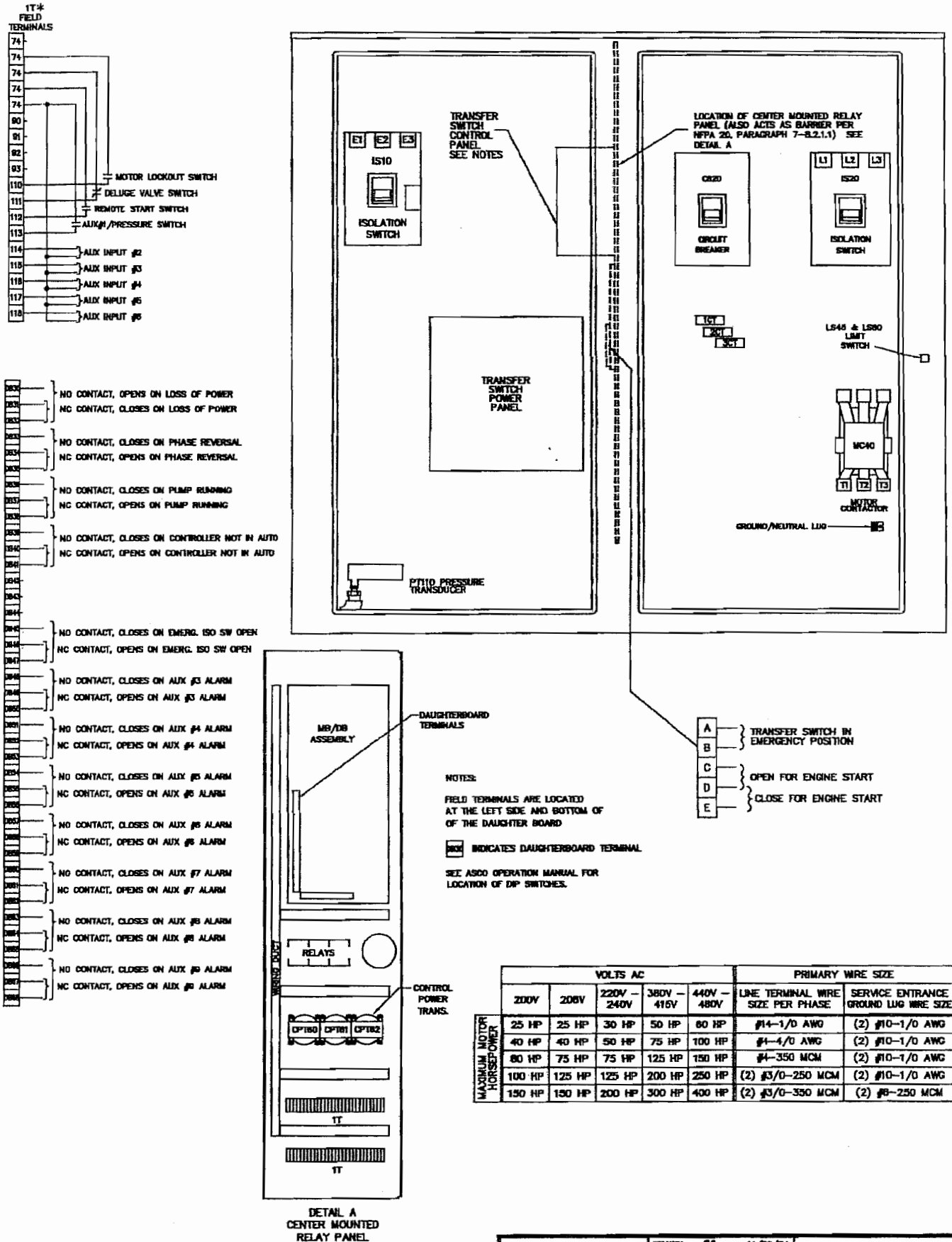
	DRAWN	SR	12-20-94
	CHECK	BL	12-20-94
	APPD	JOSK	12-20-94

METRON, INC. DENVER, CO.

SCHEMATIC, GROUP 1, UTILITY GEN-SET ASCO TRANSFER SWITCH FOR ELECTRIC FIRE PUMP CONTROLLER

CS32675B

SCALE N.T.S. SHEET 1 OF 1



NOTES:

FIELD TERMINALS ARE LOCATED AT THE LEFT SIDE AND BOTTOM OF OF THE DAUGHTER BOARD

[XXX] INDICATES DAUGHTERBOARD TERMINAL

SEE ASCO OPERATION MANUAL FOR LOCATION OF DIP SWITCHES.

DETAIL A
CENTER MOUNTED
RELAY PANEL

MAXIMUM MOTOR HORSEPOWER	VOLTS AC					PRIMARY WIRE SIZE	
	200V	208V	220V – 240V	380V – 415V	440V – 480V	LINE TERMINAL WIRE SIZE PER PHASE	SERVICE ENTRANCE GROUND LUG WIRE SIZE
	25 HP	25 HP	30 HP	50 HP	60 HP	#14–1/0 AWG	(2) #10–1/0 AWG
	40 HP	40 HP	50 HP	75 HP	100 HP	#4–4/0 AWG	(2) #10–1/0 AWG
	80 HP	75 HP	75 HP	125 HP	150 HP	#4–350 MCM	(2) #10–1/0 AWG
	100 HP	125 HP	125 HP	200 HP	250 HP	(2) #3/0–250 MCM	(2) #10–1/0 AWG
	150 HP	150 HP	200 HP	300 HP	400 HP	(2) #3/0–350 MCM	(2) #8–250 MCM

THIS DRAWING IS PROVIDED FOR REFERENCE ONLY AND IS SUBJECT TO CHANGE WITHOUT NOTICE.
PLEASE CONSULT FACTORY FOR CURRENT DATA APPLICABLE TO THE HORSEPOWER RANGE INDICATED

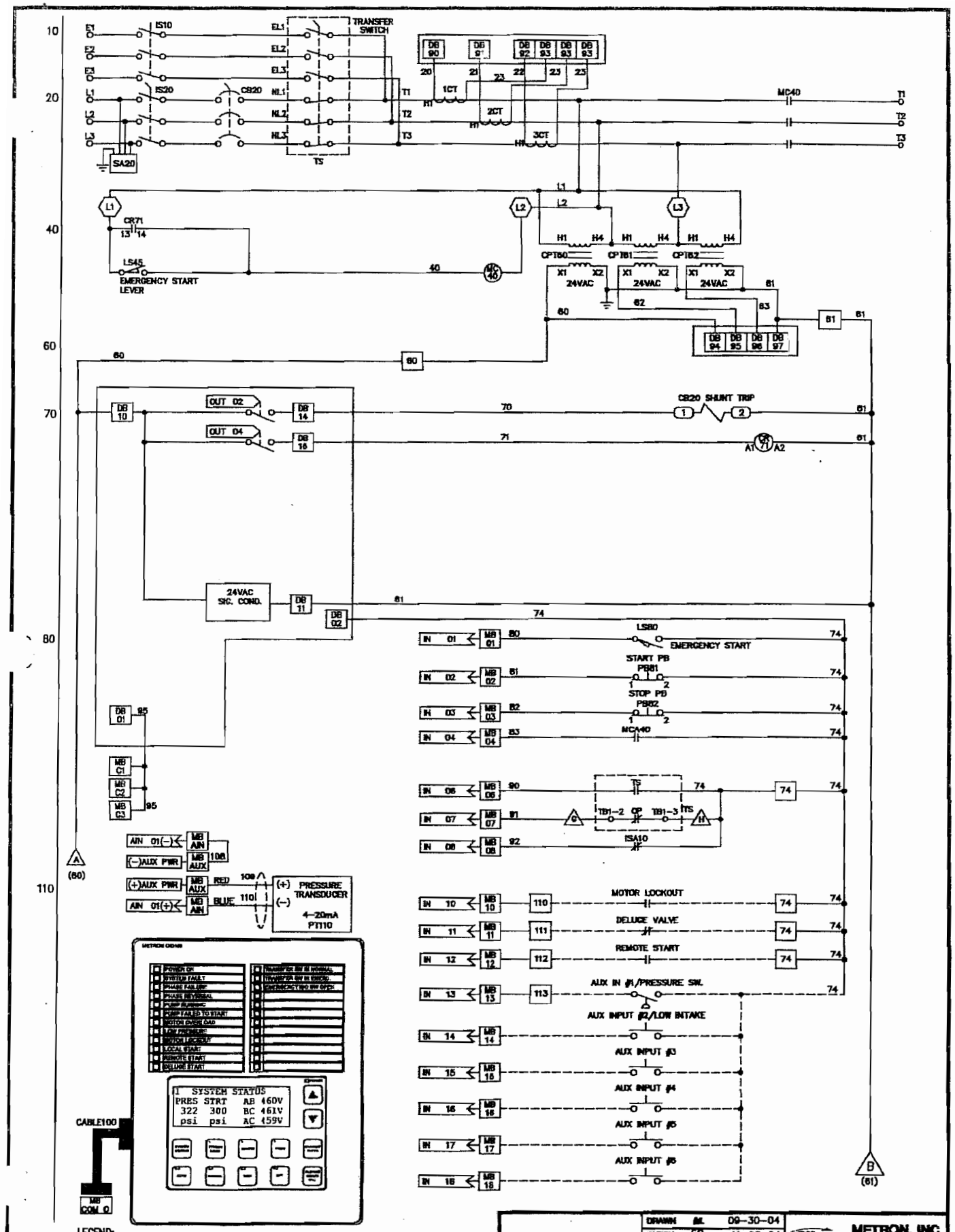
	DRAWN	RL	11/09/04
	CHECK	SB	11/30/04
	APPD	TTL.K.	12/02/04

METRON, INC.
DENVER, CO.

INTERNAL LAYOUT & EXTERNAL HOOKUP
MODEL MP300 UTILITY/GEN-SET
ELECTRIC FIRE PUMP CONTROLLER
WITH ASCO TRANSFER SWITCH, GROUP 1

CH33708

SCALE N.T.S | SHEET 1 OF 1



LEGEND:

MB AF – MB = MB100 MOTHERBOARD I/O TERMINAL

DB AF – DB = DB200 DAUGHTERBOARD I/O TERMINAL

(1) – WIRES OR TERMINALS LOCATED ON CIRCUIT BREAKER

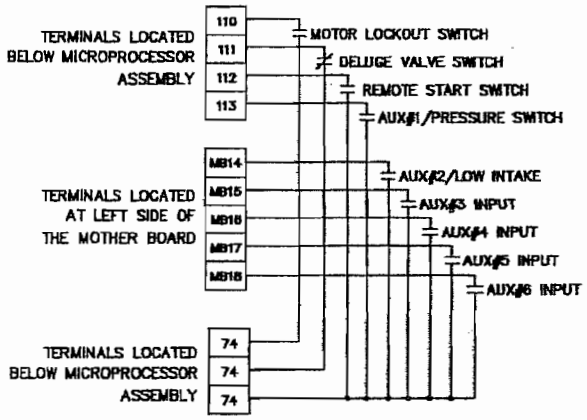
DRAWN	BL	09-30-04
CHECK	SB	11-05-04
APPD	M.H.	11-05-04

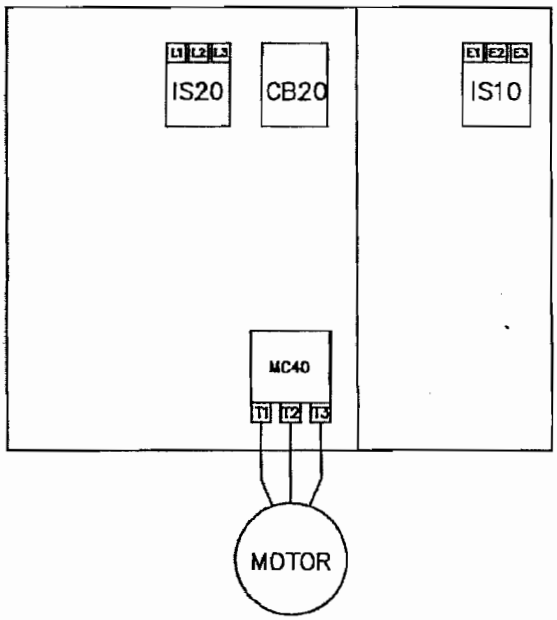
METRON, INC.
DENVER, CO.

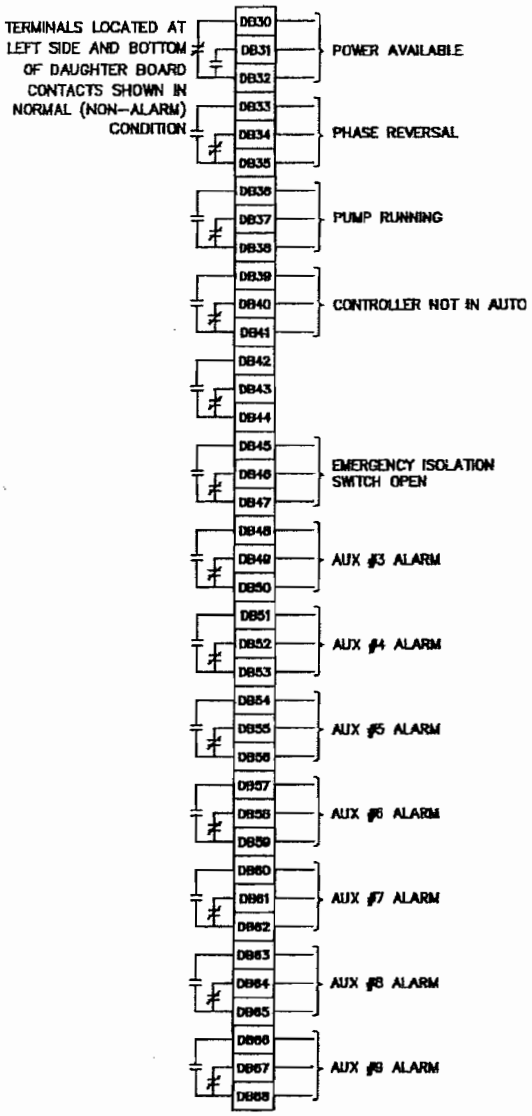
SCHEMATIC, MODEL MP300 COMBINED MANUAL-AUTOMATIC, ACROSS THE LINE ELECTRIC FIRE PUMP CONTROLLER WITH TRANSFER SWITCH -- UTILITY/GEN-SET

OPTIONS:
CS33661A

SCALE NTS | SHEET 1 OF 2

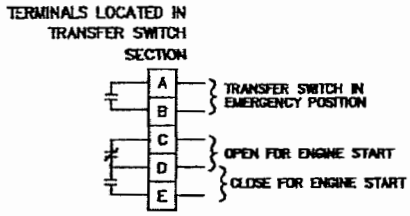






NOTES:

1. MOTOR TERMINATIONS VARY WIDELY BETWEEN MANUFACTURERS. PLEASE REFER TO MOTOR CONNECTION DIAGRAM ON THE MOTOR FOR VARIFICATION.
2. PROPER PHASE SEQUENCE MUST BE OBSERVED. A,B,C – L1,L2,L3 AS CONTROLLER IS PHASE SEQUENCE SENSITIVE
3. INCOMING CABLE SIZE TO BE 125% OF MOTOR FULL LOAD CURRENT. REFER TO WIRE SIZE TABLES IN NFPA 70.



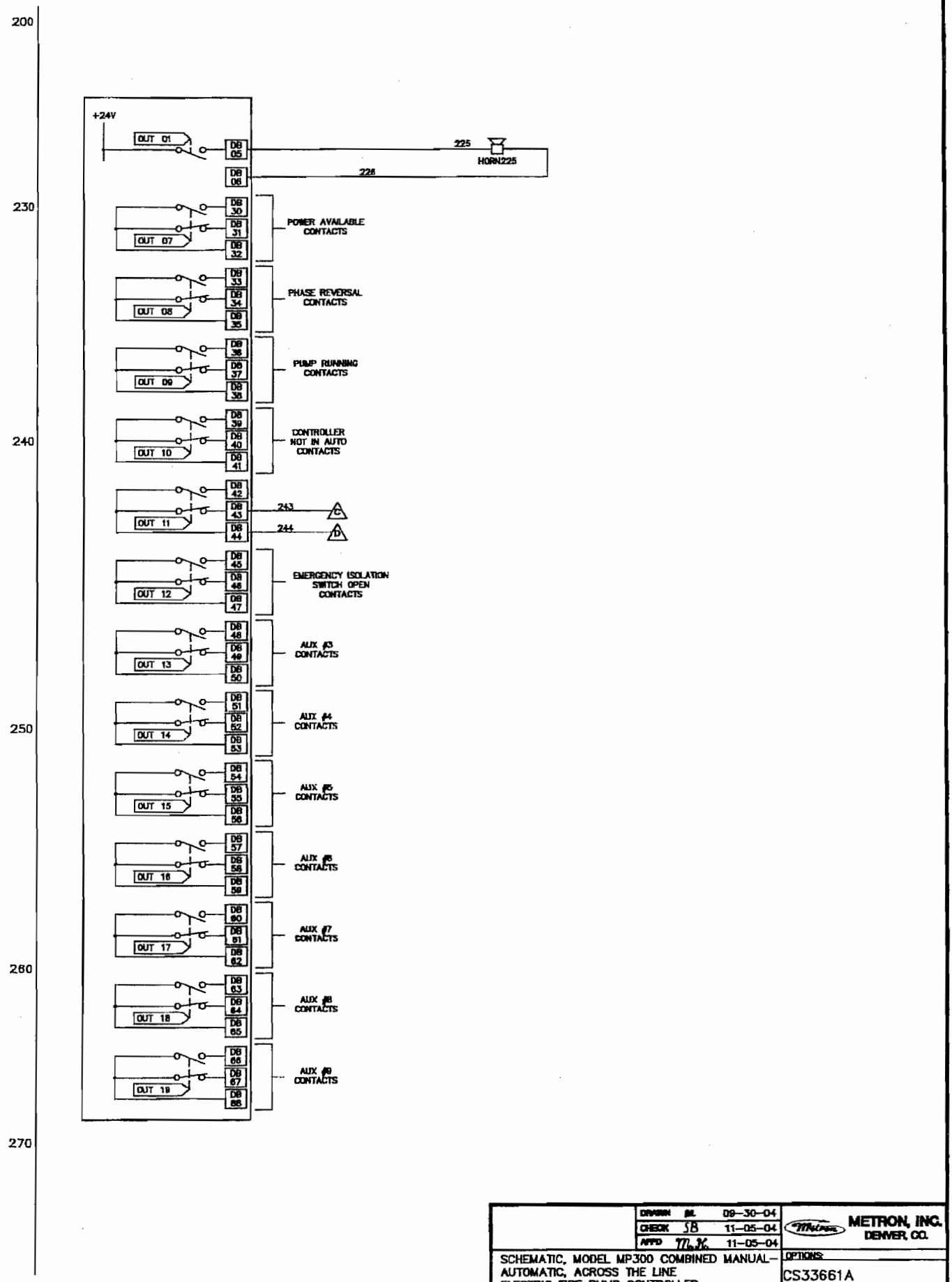
MAXIMUM MOTOR HORSEPOWER	VOLTS AC					PRIMARY WIRE SIZE	
	200V	208V	220V – 240V	380V – 415V	440V – 480V	LINE TERMINAL WIRE SIZE PER PHASE	SERVICE ENTRANCE GROUND LUG WIRE SIZE
	25 HP	25 HP	30 HP	50 HP	60 HP	#14–1/0 AWG	(2) #10–1/0 AWG
	40 HP	40 HP	50 HP	75 HP	100 HP	#4–3/0 AWG	(2) #10–1/0 AWG
	60 HP	75 HP	75 HP	125 HP	150 HP	#3/0–350 MCM	(2) #10–1/0 AWG

DRAWN	BA	03-25-05	METRON, INC. DENVER, CO.
CHECK	TL.K.	03-31-05	
APPD	SB	03-31-05	

EXTERNAL HOOKUP DIAGRAM
MODEL MP300 WITH MTS
ELECTRIC FIRE PUMP CONTROLLER

CH34010A

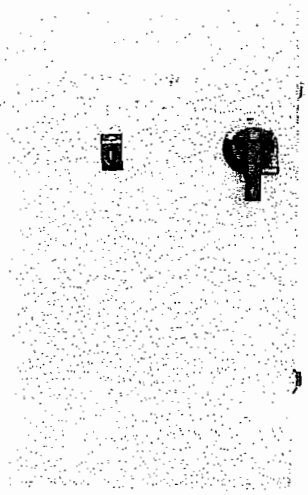
SCALE N.T.S | SHEET 1 OF 1



DRAWN BL 09-30-04	METRON, INC. DENVER, CO.	
CHECK SB 11-05-04		
APPD MK 11-05-04		
SCHEMATIC, MODEL MP300 COMBINED MANUAL-AUTOMATIC, ACROSS THE LINE ELECTRIC FIRE PUMP CONTROLLER WITH TRANSFER SWITCH – UTILITY/GEN-SET	OPTIONS: CS33661A	
	SCALE NTS	SHEET 2 OF 2

M15 Series Jockey Pump Controllers

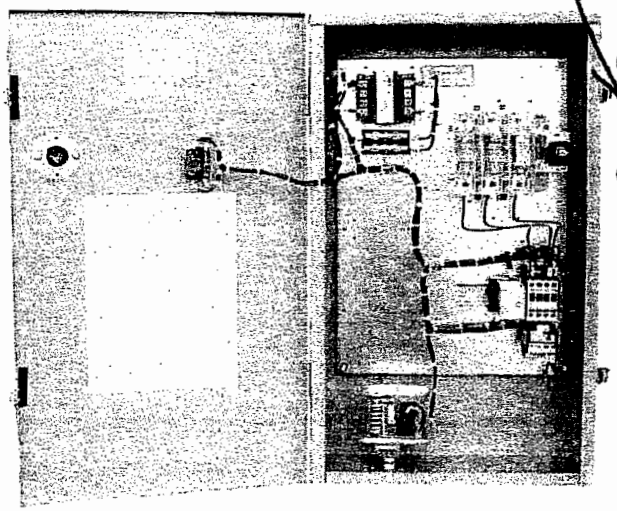
M15 Series Jockey Pump Controllers



The M15 Jockey (or make-up) Pump Controllers are in the same system as the main fire pump controller(s). Their purpose is to maintain normal water pressure and to help prevent unnecessary cycling of the main fire pump(s).

The M15 series jockey Pump Controllers are listed to UL 508 Standard for Industrial Controls. Each controller contains an externally operable fused disconnect switch with fuses which are horsepower rated, a motor contactor with protective overload relay, and a door mounted hand-off-auto switch all housed in a NEMA 2 drip proof enclosure. As an option, a circuit breaker is available in lieu of the fused disconnect

The M15A, M15B, and M15C Jockey Pump Controllers include a pressure switch with independent high and low set points for automatic starting and stopping. The pressure switch is piped to an external 1/4 inch NPT connector.



The **M15A** incorporates a control power transformer and run period timer.

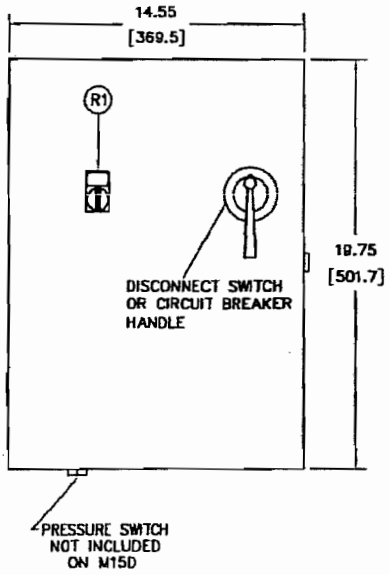
The **M15B** omits the run period timer and the control power transformer (transformer is available as an optional adder)

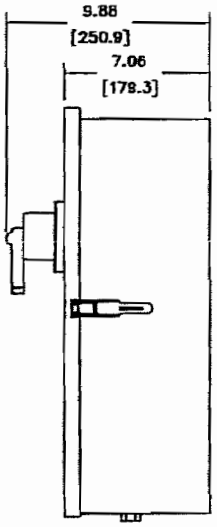
The **M15C** incorporates a pneumatic timer thus eliminating the cost of a separate control power transformer (transformer is available as an optional adder).

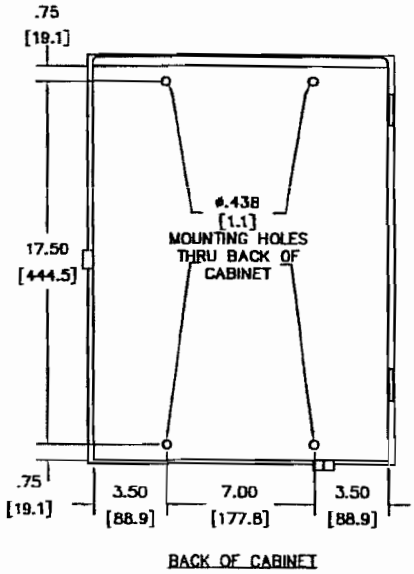
Standard features of the M15A

- Externally operable disconnect
- Horsepower rated fuses
- Hand-Off-Auto selector switch
- Pressure switch
- Control power transformer
- Minimum run period timer
- NEMA 2 enclosure

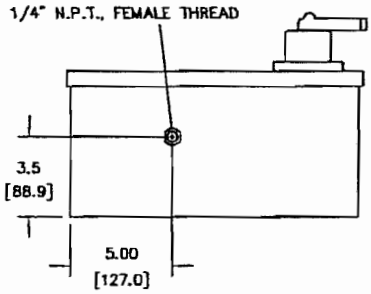
M15A Jockey Pump Controller





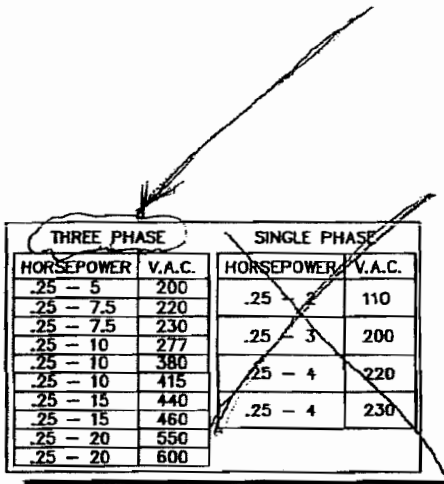


BACK OF CABINET



PILOT DEVICE LEGEND

R1. HAND–OFF–AUTO SWITCH



THREE PHASE		SINGLE PHASE	
HORSEPOWER	V.A.C.	HORSEPOWER	V.A.C.
.25 – 5	200	.25 – 2	110
.25 – 7.5	220	.25 – 3	200
.25 – 7.5	230	.25 – 4	220
.25 – 10	277	.25 – 4	230
.25 – 10	380		
.25 – 10	415		
.25 – 15	440		
.25 – 15	460		
.25 – 20	550		
.25 – 20	600		

NOTES:
ALL DIMENSIONS ARE SHOWN IN INCHES AND CENTIMETERS ([]).

DRAWN	[illegible]	03/20/17
CHECK	[illegible]	04/20/17
APPD	[illegible]	04/20/17

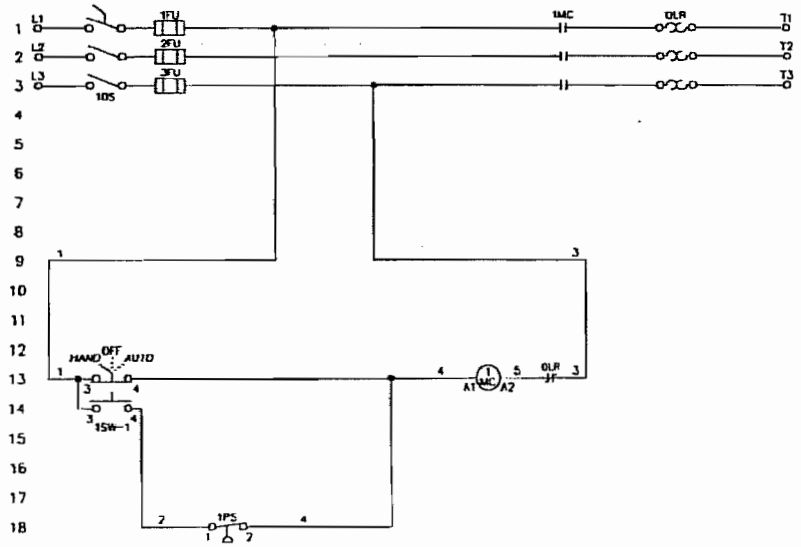
METRON, INC.
DENVER, CO.

CABINET OUTLINE, STANDARD CUBE
M15 JOCKEY PUMP CONTROLLER
NEMA–2 &[illegible]3R ENCLOSURE

CD34186

SCALE N.T.S. | SHEET 1 OF 1

COMPONENTS	FUNCTION	LOCATION	CONTACTS
1MC	MOTOR CONTACTOR	13	1,2,3
1DS	DISCONNECT SWITCH	1,2,3	
1FU	POWER FUSE	1	
2FU	POWER FUSE	2	
3FU	POWER FUSE	3	
1PS	PRESSURE SWITCH	18	
1SW	HAND/OFF/AUTO SELECTOR SW.	13	
OLR	OVERLOAD RELAY	1,2,3	13



NOTES FOR FIELD WIRING:

USE COPPER WIRING ONLY EXCEPT AT TERMINALS MARKED CU-AL

	DRAWN		3-1-95
	CHECK	K.A.	3-1-95
	APPD		3-1-95

METRON, INC.
DENVER, CO.

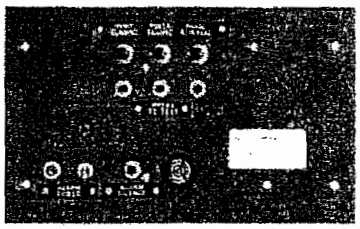
SCHEMATIC, MODEL M15B, THREE PHASE WITH FUSED DISCONNECT SWITCH JOCKEY PUMP CONTROLLER, W/O XFMR.

CS32273B

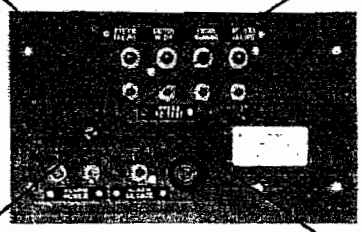
SCALE N.T.S. SHEET 1 OF 1

Remote Alarm Panels
For Fire Pump Controllers

Series 1701C – Remote Alarm Panel For Electric Motor Fire Pump Controllers



Series 1802B – Remote Alarm Panel For Diesel Driven Fire Pump Controllers



Metron alarm panels have been designed to provide reliable audible and visual alarms for electric and diesel fire pump controllers in accordance with NFPA 20. This requires that visual and audible alarms powered by a reliable source, not exceeding 125 volts, be located at a point of constant attendance when the pump room is not constantly attended.

Functional Description 1701 C:

Alarm Power - This light is on continually to indicate that reliable power is applied to the Alarm Panel.

Pump Running - Indicates that the Controller has operated into a pump running condition.

Pump Power Failure - Indicates loss of line power on line side of motor starter.

Phase Reversal - Indicates phase reversal on line side of motor starter.

Press-to-Test Switches - Each status lamp is furnished with individual Press-to-Test switches which verify lamp operation and associated circuitry is functioning properly.

Alarm Silence - An alarm silence button is provided so that the audible alarm may be turned off in the event of an alarm signal. The light will stay on until the Controller condition has been returned to normal. Should another signal be received after the alarm silence button has been depressed, the alarm will re-sound and the respective alarm light will be illuminated.

Power Requirements - A reliable source of 117 volts, A.C., 50/60 HZ.

Connecting Cable - Number 16 gauge conductor low voltage (24 VDC) cable may be used for interfacing between the controller and Remote Alarm Panel. Smaller wire may be used so long as the total loop resistance is held to 50 ohms or below.

Options Available:
Extra Lights - Additional alarm lights (up to a total of eight, including standard lights) may be supplied. Customer to specify labeling.

Remote Start - A remote start pushbutton may be supplied.

Auxiliary Alarm - A relay may be supplied in the panel to provide contacts for a common auxiliary alarm.

Features:
1. Solid state circuitry for high reliability and trouble free service.
2. Rugged compact enclosure for surface or flush mounting.
3. Audible alarm with silencing pushbutton.
4. Press-to-Test switches for each light.
5. UL approved.
6. Simple low cost installation.
7. Compatible with all Metron electric controllers.

Functional Description 1802 B:

Alarm Power - This light is on continually to indicate that reliable power is applied to the Alarm Panel.

Engine Running - Indicates that the Controller has operated into a pump running condition.

System Failure - Indicates one or more of the following conditions exist on either the engine or the controller: a) High Water Temperature, b) Low Oil Pressure, c) Engine Overspeed (diesel only), d) Overcrank (the engine fails to start upon demand or a weekly test run), e) Loss of D.C. output of the charger (also indicates loss of A.C. to the controller).

Switch-in-Off - Indicates that the Controller control selector switch is in the off or manual position. The controller switch should be left in the "auto" position, which will allow the engine to start upon demand.

Battery Failure - Indicates that one or both batteries has fallen to a level such that either one or both may not be capable of starting the engine and requires attention.

Press-to-Test Switches - Each status lamp is furnished with individual Press-to-Test switches which verify lamp operation and associated circuitry is functioning properly.

Alarm Silence - An alarm silence button is provided so that the audible alarm may be turned off in the event of an alarm signal. The light will stay on until the Controller condition has been returned to normal. Should another signal be received after the alarm silence button has been depressed, the alarm will re-sound and the respective alarm light will be illuminated.

Power Requirements - A reliable source of 117 volts, A.C., 50/60 HZ.

Connecting Cable - Number 16 gauge conductor low voltage (24 VDC) cable may be used for interfacing between the controller and Remote Alarm Panel. Smaller wire may be used so long as the total loop resistance is held to 50 ohms or below.

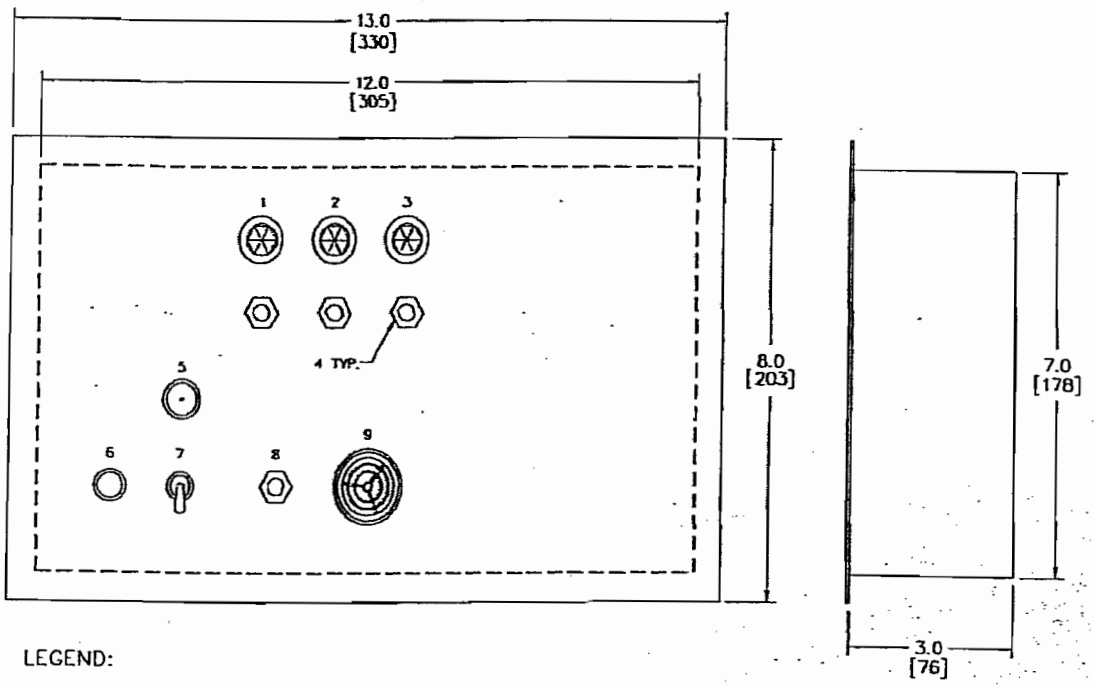
Options Available:
Extra Lights - Additional alarm lights (up to a total of eight, including standard lights) may be supplied. Customer to specify labeling.

Remote Start - A remote start pushbutton may be supplied.

Auxiliary Alarm - A relay may be supplied in the panel to provide contacts for a common auxiliary alarm.

Features:
1. Solid state circuitry for high reliability and trouble free service.
2. Rugged compact enclosure for surface or flush mounting.
3. Audible alarm with silencing pushbutton.
4. Press-to-Test switches for each light.
5. UL approved.
6. Simple low cost installation.
7. Compatible with all Metron diesel controllers.

Metron, Inc. • 1505 West 3rd Ave., • Denver, Colorado 80223 • (303) 592-1903 • EMAIL: sales@metroninc.com • FAX (303) 534-1947
Bulletin RAP 04/03



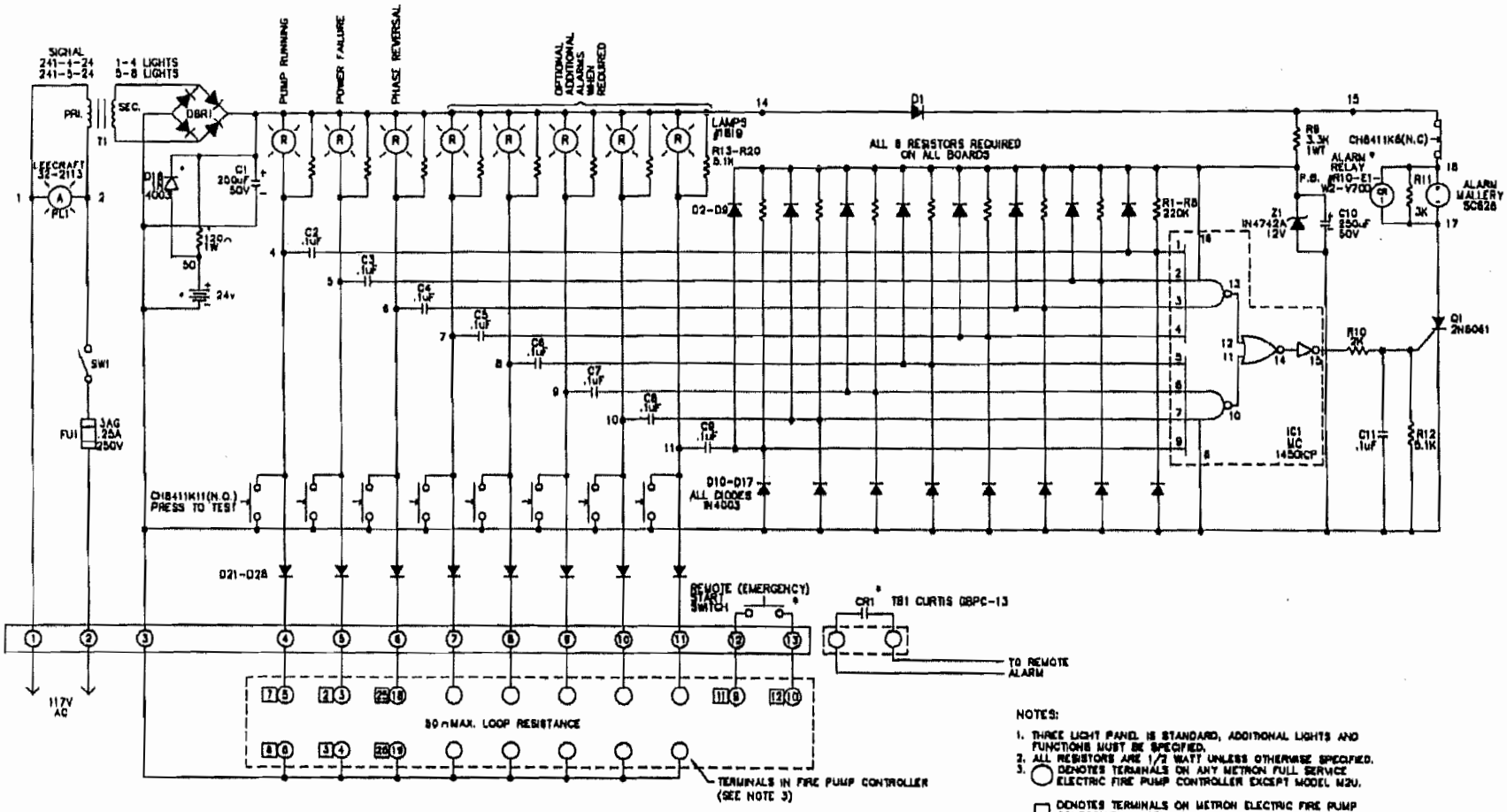
LEGEND:

1. PUMP RUNNING LIGHT
2. POWER FAILURE LIGHT
3. PHASE REVERSAL LIGHT
4. PRESS TO TEST BUTTONS
5. FUSE
6. POWER "ON" LIGHT
7. ALARM POWER SWITCH
8. ALARM SILENCE BUTTON
9. ALARM

NOTE:

1. ALL DIMENSIONS ARE SHOWN IN INCHES AND MILLIMETERS ([]).

	DRAWN JAS 11-23-94	METRON, INC. DENVER, CO.	
	CHECK JCA 11-29-94		
	APPD JCEY 12-20-94		
ENCLOSURE DIMENSIONS, NEMA 1 MODELS 1701C ~~& 2701C~~ UP TO 8 LIGHTS REMOTE ALARM PANEL		CD32293	
		SCALE 3/4	SHEET 1 OF 1



NOTES:

1. THREE LIGHT PANEL IS STANDARD, ADDITIONAL LIGHTS AND FUNCTIONS MUST BE SPECIFIED.
2. ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED.
3. ◯ DENOTES TERMINALS ON ANY METRON FULL SERVICE ELECTRIC FIRE PUMP CONTROLLER EXCEPT MODEL M2U.

   ☐ DENOTES TERMINALS ON METRON ELECTRIC FIRE PUMP CONTROLLER MODEL M2U.
4. IF TERMINALS 10 & 11 ARE NOT BEING USED FOR ADDITIONAL ALARMS, THEY WILL BE USED FOR THE CR1 CONTACT.
5. * DENOTES OPTIONAL COMPONENTS.

REMOTE ALARM NEEDS

4 - LOW AMP VOLTAGE # 14 AWG

~~START~~ 6 - ~~LOW AMP # 14 AWG~~

5 AMP 120v/1 POWER SUPPLY

(FROM BUILDING)

DRAWN	J.I.	4-17-89	METRON, INC. DENVER, CO.
CHECK	DV	4-19-89	
APPD	DV	4-19-89	

SCHEMATIC
MODEL 1701C, REMOTE ALARM PANEL
CLOSE CIRCUIT TO ALARM

CS30674N

SCALE N.T.S. | SHEET 1 OF 1

SPECIFICATION SHEET

FEBCO®

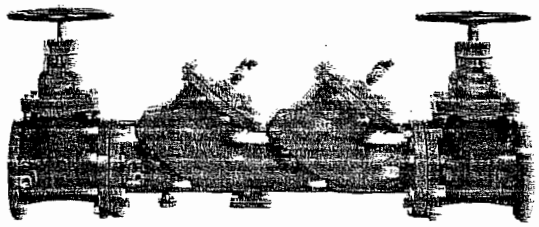
MASTER series®

MasterSeries® 850

Double Check Valve Assemblies

Size: 2½" - 10" (65mm - 250mm)

The FEBCO Master Series® 850 Double Check Valve Assemblies are designed for non-health hazard applications.
End Connections – Flanged ANSI B16.1 Class 125



Model 850 Double Check Assembly
U.S. Patent No. 4,989,635

Pressure – Temperature

Max. Working Pressure:	175psi (12.1 bar)
Hydrostatic Test Press:	350psi (24.1 bar)
Temperature Range:	32°F to 140°F (0°C to 60°C)

Materials

Main Valve Body:	Ductile iron Grade 65-45-12
Coating:	Fusion epoxy coated internal and external AWWA C550-90
Shutoff Valves:	NRS resilient wedge gate valves AWWA C509
Trim:	Bronze
Elastomer Discs:	EPDM
Spring:	Stainless steel
Clamp:	AWWA C606

Approvals – Standards

- Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California. - 2½" - 8" (65 - 80mm) (Horizontal & Vertical Up)
- ANSI/AWWA (C510) - 2½" - 8" (Horizontal & Vertical Up), 10" (Horizontal)

1015
2½" - 8"
(65 - 200mm)
(Horizontal & Vertical up)
10" (250mm)
(Horizontal)

B64.5

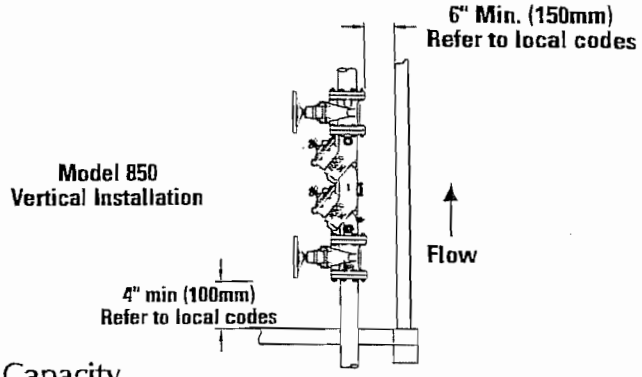
FM Approved

2½" - 8"
(65 - 200mm)
(Horizontal & Vertical up)

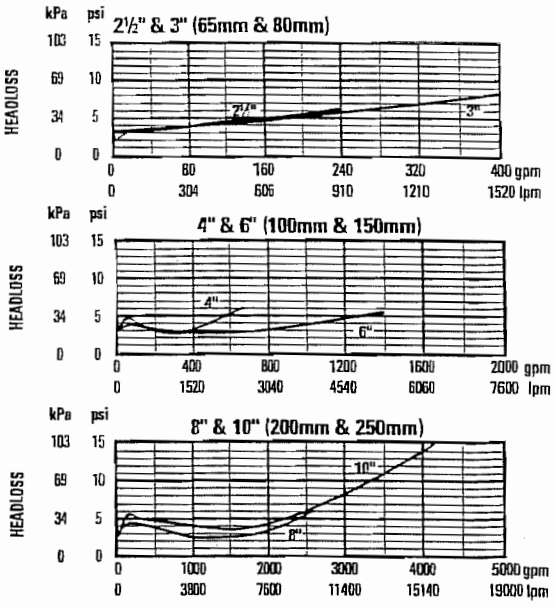
* Less gates not FM approved. Less gates not UL Classified unless installed with UL listed gate valves.

Models

- UL/FM OS&Y RW Gate Valves
- Wye-Strainer



Capacity



Job Name _____ Contractor _____

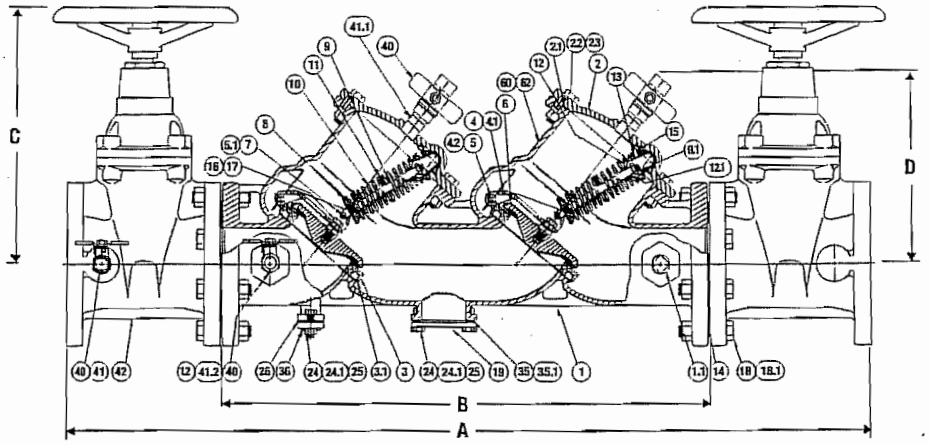
Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

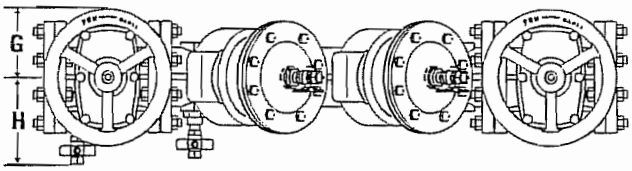
FEBCO product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise mea-

Model 850 / Materials of Construction



#	DESCRIPTION	MATERIAL
1	Body	A536 GR 65-45-12
1.1	Pipe Plug	Galv. Steel
1.2	Bushing (21/2 -4 only)	Brass
2	Cover	A536 GR 65-45-12
2.1	O-Ring	EPDM ASTM D2000
2.2	Cap Screw	Plated Steel
2.3	Hex Nut	Plated Steel
3	Seat Ring	B584 Alloy C83600
3.1	Gasket	EPDM ASTM D2000
4	Arm	B584 Alloy C83600
4.1	Bushing-Swing Pin	Acetal Resin
4.2	Swing Pin	304 SS
5	Retaining Clip	302 SS
5.1	Retaining Clip	302 SS
6	Check Disk Assy	EPDM Coated GR, 45 Ductile Iron with type 304 SS stem
7	Load Pin	304 SS
8	Lwr Spring Retnr	B584 Alloy C83600
9	Spring Stem	304 SS
9.1	Elastic Stop Jam Nut	18-8 SS
10	Spring	A313 Type 631 SS
11	Spring Guide	B130 Alloy C22000
12	Upr Spring Retnr	B584 Alloy C83600
12.1	Bushing-Spr. Stem	Acetal Resin
13	Pivot Bearing	B585 Alloy C83600
14	Flange Gasket	Rubber/Fabric
15	Bearing Socket	Acetal Resin
16	Hex Jam Nut	18-8 SS
17	Washer	302 SS
18	Flange Nut	Plated Steel
18.1	Flange Nut	Plated Steel
19	Cover	A36 Stl Epoxy Coated
24	Bolt	Plated Steel
24.1	Washer	Plated Steel
25	Nut	Plated Steel
26	Gasket	EPDM ASTM D2000
35	O-Ring	EPDM ASTM D2000
35.1	Back-Up Ring	Acetal Resin
36	Cover	B584 Alloy C83600
40	Ball Valve	B584 Alloy C84400
41	Nipple	Brass
41.1	Nipple	Brass
41.2	Nipple	Brass
42	Gate Valve	AWWA C509
60	Id Plate	B36 Alloy C26000
62	Drive Screw	SS
70	Clamp (10" Only, Not Shown Above)	AWWA 606

Top View



Dimensions and Weights

Size: 2½" - 10" (65 - 250mm)

SIZE (DN)		DIMENSIONS															
		A		B		C*		D		G		H		NRS		OS&Y	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kgs.	lbs.	kgs.
2½	65	40¾	1035	25½	648	12⅝	321	10	254	4½	114	7⅛	181	199	90	203	92
3	80	41⅛	1064	25⅝	651	12⅞	327	10	254	4½	114	7⅜	187	211	96	213	97
4	100	46¼	1175	28	711	14⅜	365	10⅛	257	5½	140	8⅛	206	288	131	312	142
6	150	56	1422	34¾	883	18⅞	479	12¾	324	6½	165	9⅞	251	450	204	494	224
8	200	65	1651	41¾	1061	23½	597	15⅝	397	7	178	11⅛	283	711	323	773	351
10	250	72⅝	1845	46⅜	1178	27½	699	15⅝	397	9	229	12⅜	314	980	445	1080	490

* With NRS Gate Valves

Note: Dimensions shown are nominal. Allowances must be made for normal manufacturing tolerances.

FEBCO®

MASTER series®

ISO 9001 CERTIFIED

A Division of Watts Water Technologies, Inc.

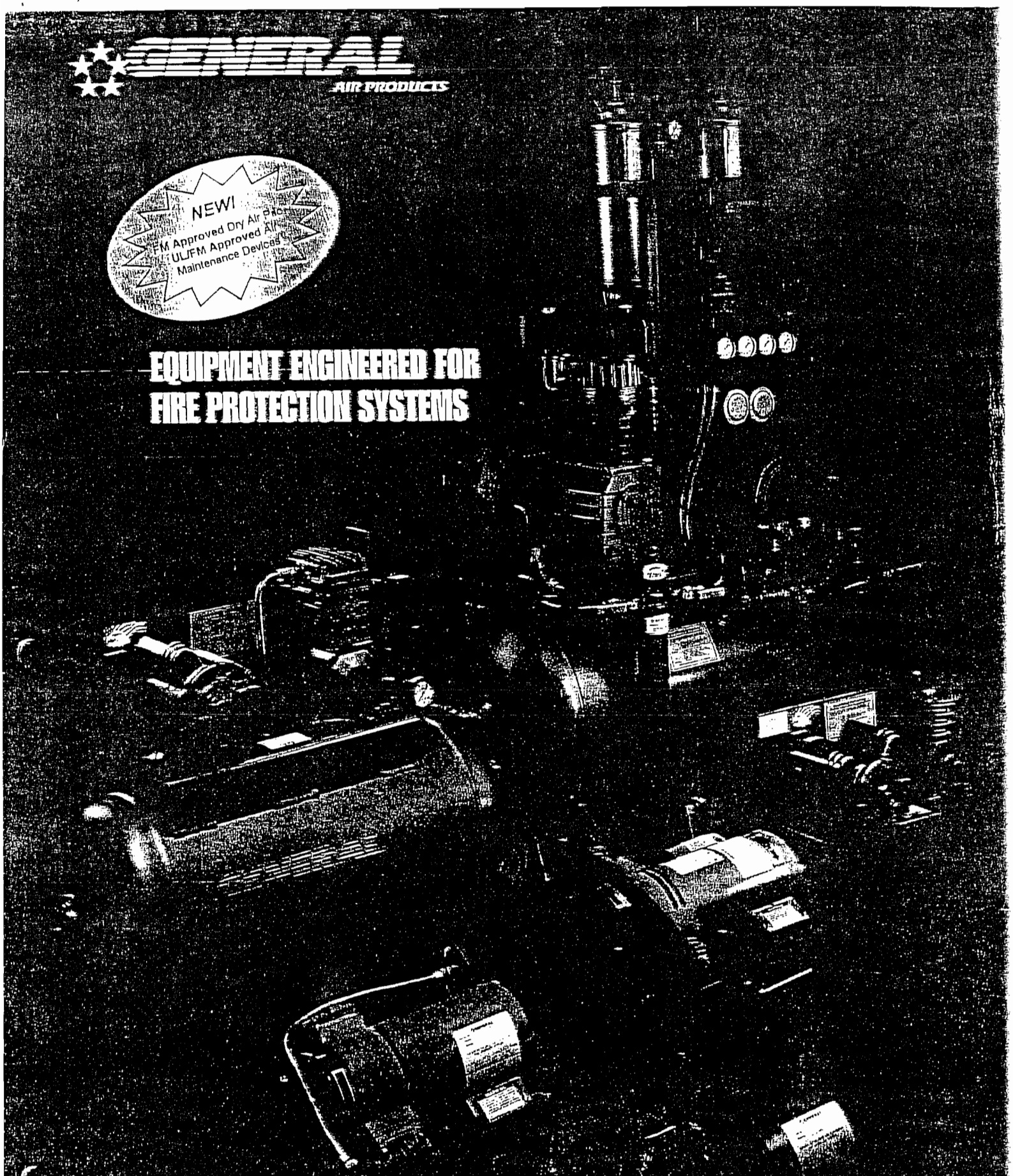
USA: 4381 N. Brawley • Ste. 102 • Fresno, CA • 93722 • Tel. (559) 441-5300 • Fax: (559) 441-5301 • www.FEBCOonline.com

Canada: 5435 North Service Rd. • Burlington, ONT. • L7L 5H7 • Tel. (905) 332-4090 • Fax: (905) 332-7068 • www.FEBCOonline.ca

GENERAL
AIR PRODUCTS

NEW!
FM Approved Dry Air Pressure Maintenance Devices
UL/FM Approved Air Maintenance Devices

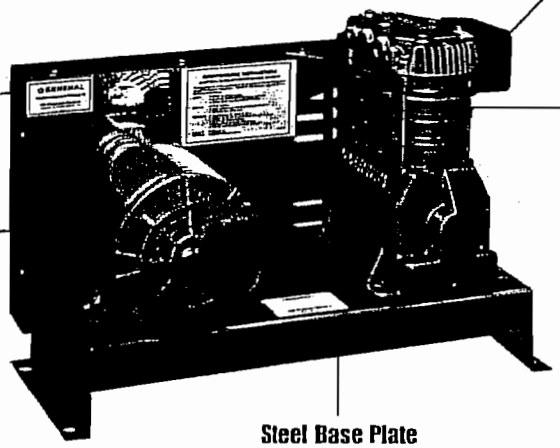
EQUIPMENT ENGINEERED FOR FIRE PROTECTION SYSTEMS



Quality and Service Since 1936

DRY PIPE SPRINKLER SYSTEMS

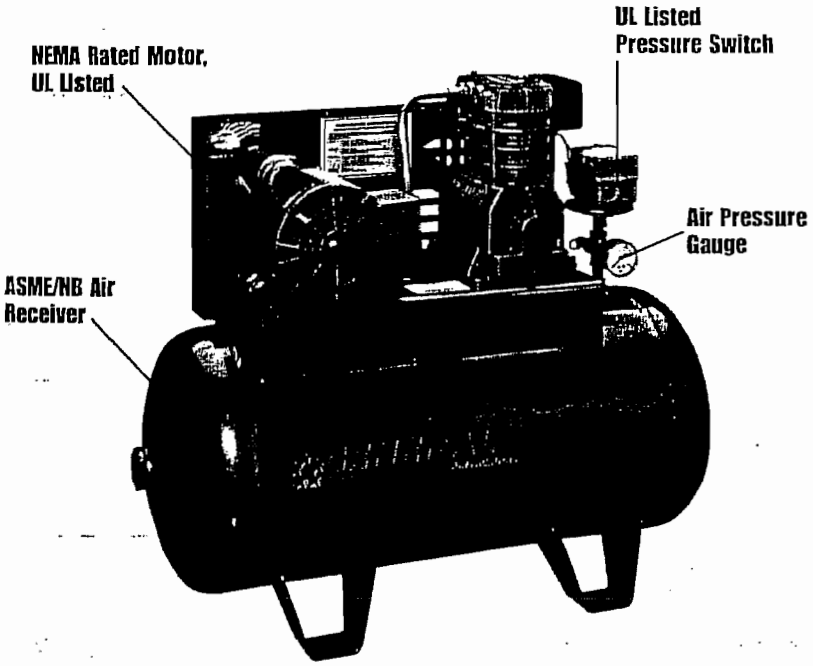
BASE MOUNTED



Automatic operation of Base Mounted Air Compressors is obtained by the use of the GENERAL Model AMD-2, UL/FM Air Maintenance Device. Compressor Oil in qt. containers, and a pressure relief valve are included with every unit.

Base and Tank Mounted Air Compressors for dry pipe sprinkler systems are designed for maximum volumetric delivery (cubic feet of air per minute) at the medium pressures required for the system. Selections, as outlined on page 6, will fill the system to 40 pounds air pressure in 30 minutes. Standard units consist of compressor, motor, V-belt drive, and enclosed belt guard. Single phase units 1/3 HP through 1-1/2 HP include internal thermal overload protection. A magnetic line starter is recommended for all other units. • Each base and tank mounted unit ships with: Compressor Oil in quart container(s). • Pressure Relief Valve (shipped loose with base units only)

TANK MOUNTED



Tank Mounted Air Compressors are integrally mounted on A.S.M.E. air receivers to offer further ease of installation and versatility. Multiple dry valves may be supplied from the one compressor tank which is a constant source of air†. Tank mounted units should always be used when an accelerator is required on the sprinkler system. Use GENERAL Model AMD-1, UL/FM Air Maintenance Device, when required. Compressor Oil in quart containers shipped with every tank unit.

- *A.S.M.E. Safety Valve*
- *Industrial Air Check Valve*

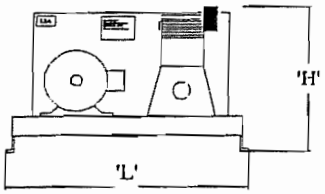
See "Notes" Page 7

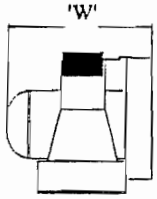
SPECIFICATIONS & DIMENSIONS

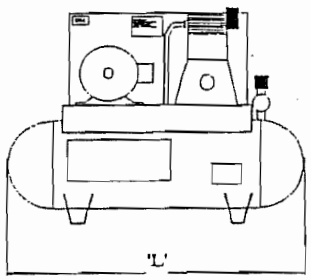
BASE AND TANK MOUNTED AIR COMPRESSORS

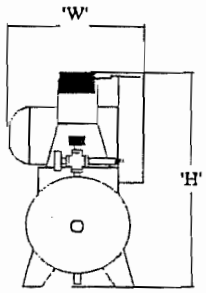
BASE MODEL[1]	TANK MODEL[1]	MOTOR H.P. 60 CYCLE	SYSTEM CAPACITY GALLONS 60 CYCLE	MOTOR H.P. 50 CYCLE	SYSTEM CAPACITY GALLONS 50 CYCLE	DIMENSIONS (Inches) BASE MOUNTED L	W	H	TANK MOUNTED L	W	H	TANK CAPACITY (gallons)
L20033*	LT20033*	1/3	200	1/4	165	23	11	13	33	13	25	10
L29050*	LT29050*	1/2	290	1/3	240	23	11	13	33	13	25	10
L36575*	LT36575*	3/4	365	1/2	260	23	11	13	33	13	25	10
L425100*	LT425100*	1	425	3/4	320	23	11	13	33	13	25	10
L620100*	LT620100*	1	620	3/4	460	23	14	15	36	15	30	20
L900150*	LT900150*	1-1/2	900	1	675	23	14	15	36	15	30	20
L1300300*	LT1300300*	3	1300	2	800	23	15	15	36	15	30	20
L1600300*	LT1600300*	3	1600	2	1100	34	16	28	40	18	44	30
L2000500*	LT2000500*	5	2000	3	1500	34	16	28	40	18	44	30
L2500500*	LT2500500*	5	2500	3	1800	34	16	28	40	18	44	30

Refer to Tech Data Sheets for Voltage Ratings
* A=Single Phase B=Three Phase
[1] Add -50 to End of Model Number to Specify 50 Cycle





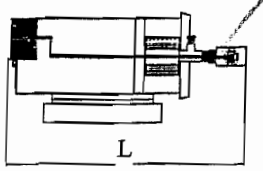


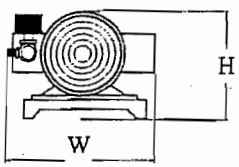


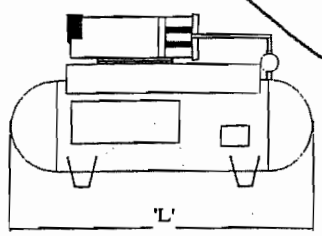
OIL-LESS COMPRESSORS

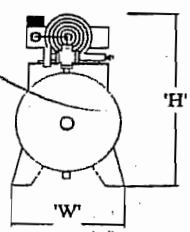
RISER MOUNTED MODEL NUMBER[1]	TANK MOUNTED MODEL NUMBER[1]	MOTOR H.P.	SYSTEM CAPACITY GALLONS 60 CYCLE	SYSTEM CAPACITY GALLONS 50 CYCLE	DIMENSIONS (inches) RISER MOUNTED L	W	H	TANK MOUNTED L	W	H	TANK CAPACITY (gallons)
OL11016AC	OL11016ACT	1/6	110	90	14	9	9	32	13.5	22.5	10
OL21533AC	OL21533ACT	1/3	215	200	16	9	10	32	13.5	23	10
OL33550AC	OL33550ACT	1/2	335	270	16	11	9	32	13.5	23	10
OL42575AC	OL42575ACT	3/4	425	340	17	11	9	32	13.5	23	10
OL525100AC	OL525100ACT	1	525	420	17	11	9	32	13.5	23	10
OL675100AC	OL675100ACT	1	675	540	20	18	10	35	14	24	20
OL800150AC	OL800150ACT	1-1/2	800	640	22	18	10	35	14	24	20

* Units 115 or 115/230 VAC only
[1] Add -50 to End of Model Number to Specify 50 Cycle





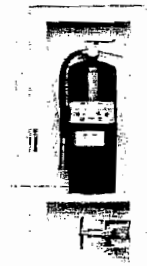




1750 SERIES FIRE EXTINGUISHER&VALVE CABINETS CROKER



1750 Series



1770 Series

For Use With Fire Dept Valve, 2 1/2" Fire Dept Valve & Fire Extinguisher

Series 1750 and 1770 cabinets will accommodate Fire Dept Valves, 1 1/2" and or 2 1/2" size with caps and chain and a portable Fire Extinguisher.

STANDARD EQUIPMENT

* Heavy gauge steel construction tub, door and trim- white enamel interior
* Electrostatic white primer white powder coat finish
* Continuous steel piano hinge
* Pull handle with roller catch

CABINET OPTIONS

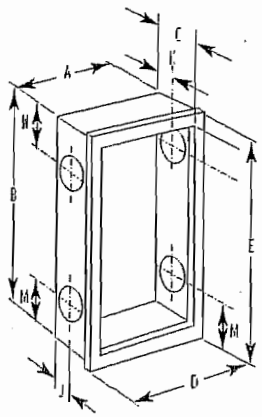
* Prefix FR for Fire Rated Cabinet
* Suffix AL for clear anodized aluminum door and frame
* Suffix SS for Stainless Steel # 4 finish door and frame
* Suffix FF for Detention Grade Heavy Steel Door And Trim
* Door Styles See page 2-6
* Other cabinet options See page 2-7, 2-19 and 2-20

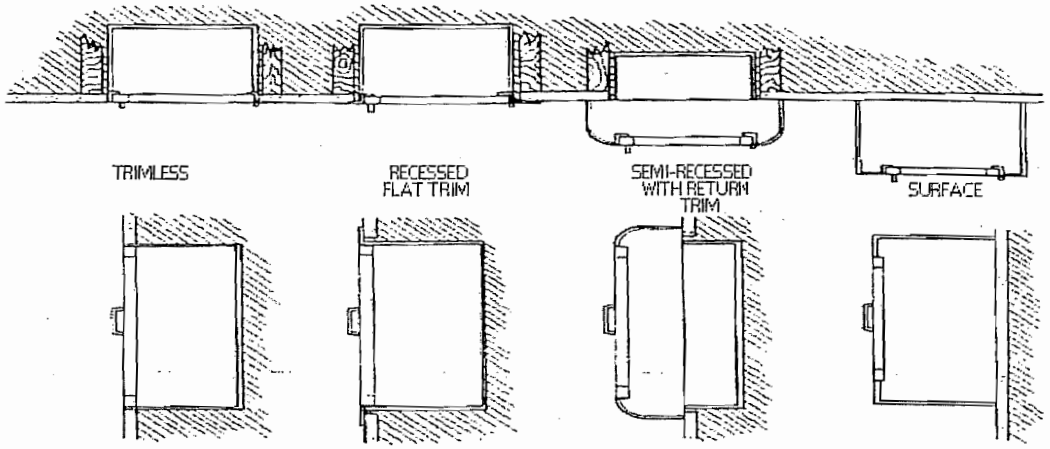
ORDERING PROCEDURE

* Select cabinet Figure No.
* Select door style
* Select Fire Dept Valve with Cap and Chain (Refer to Section 5000)
* Select type and size of Fire Extinguisher

FIGURE #	TRIM STYLE	Trim Proj. Tp	Valve Cap.	Inside box dimensions			Overall outside dim		Knockout locations				Wall Opening Required			FIRE RATED CABINETS Wall Opening Required FR Option		
				A	B	C	D	E	J	K	M	N	Width	Height	Depth	Width	Height	Depth
1750	Recessed	5/16"		20	27	7 3/4	23 3/8	30 3/8	4	4	4	4	21	28	7 7/8	22	29 1/8	8 1/2
1751	Semi-recessed	1 1/4"	1 1/2	20	27	7 3/4	23 3/8	30 3/8	4	4	4	4	21	28	6 3/4	22	29 1/8	7 3/8
1752	Semi-recessed	2 1/2"	or	20	27	7 3/4	23 3/8	30 3/8	4	4	4	4	21	28	5 1/2	22	29 1/8	6 3/8
1754	Semi-recessed	4 1/2"	2 1/2	20	27	7 3/4	23 3/8	30 3/8	4	4	4	4	21	28	3 1/2	22	29 1/8	4 1/8
1758	Surface			23 3/16	30 3/16	8 1/4	23 3/8	30 3/8	4	4	4	4						
1770	Recessed	3/8"		16	40	9	19 3/8	43 3/8	6	4 1/4	6	4 1/4	17	41	9	18	42 1/8	10
1771	Semi-Recessed	1 1/4"	1 1/2	16	40	9	19 3/8	43 3/8	6	4 1/4	6	4 1/4	17	41	8 1/8	18	42 1/8	9 1/8
1772	Semi-Recessed	2 1/2"	or	16	40	9	19 3/8	43 3/8	6	4 1/4	6	4 1/4	17	41	6 5/8	18	42 1/8	7 1/2
1776	Trimless		2 1/2	16	40	9	16 1/4	40 1/4	6	4 1/4	6	4 1/4	16 1/2	40 1/2	9 1/4			
1778	Surface			19 3/16	43 3/16	9 1/2	19 3/8	43 3/8	a	a	a	a						

a- No knockouts provided unless specified on surface mounted cabinets
Note: Add 5/8" to depth of wall opening required for cabinets with aluminum frame
Note: If 2 1/2" x 1 1/2" reducing adapter is used for Fire Dept Valve "C" dimension should be no less than 10".
* Trimless, recessed and semi-recessed cabinets furnished with combination knockouts (1 1/2" and 2 1/2" on both sides)
NOTE: FIRE RATED CABINETS HAVE NO KNOCKOUTS

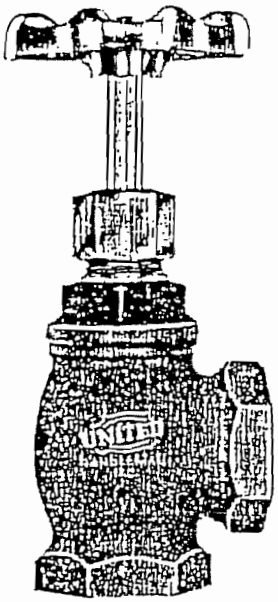




GLOBE & ANGLE VALVES

These valves are designed for general service where tight shut off and frequent use are desired. They are especially recommended for use with steam, air, oil, water and gas service, where non-metallic discs are suited.

A swivel disc holder permits disc to wear evenly and provide a tight seal under full load conditions. They are constructed so that they can be repacked with the valve in the fully opened position, while under full pressure. These valves feature easily replaceable non-metallic discs, non-asbestos packing, and heavy duty rugged construction. A choice of discs is available to make these valves suitable for most applications.



126S
126T

126SB with Bronze Handwheel
126TB with Bronze Handwheel
125SB with Bronze Handwheel
125TB with Bronze Handwheel

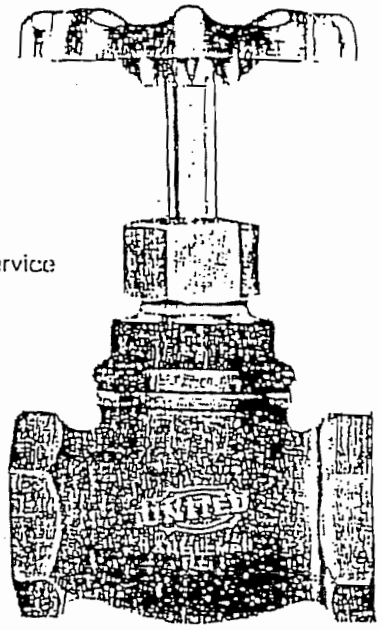
125S & 126S
Ⓤ Listed for fire sprinkler service. 2" size only. Approved by the New York City Board of Standards and Appeals under Calendar No. 1079-81-SA. Equipped with No. 125SD Rubber Disc and rated for 200 WOG service (No Steam). Recommended for fire sprinkler service.



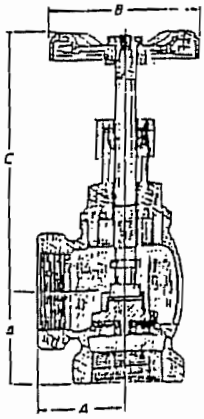
Also Available with
T Handle — 126STH

125T & 126T
Equipped with No. 125TD Teflon* disc for general service including steam

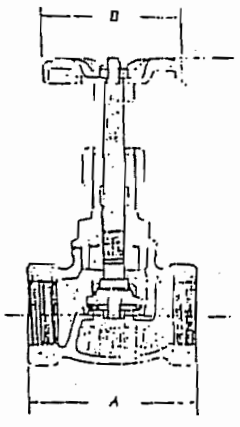
125 lbs. WSP
200 lbs. WOG
100% Pressure Tested
Screwed Ends
Rising Stem
Swivel Disc Holder
Ventilated Aluminum Alloy Hand Wheel
Available with Plastic Hand Wheel Through 1"
Body Material: Bronze Conforming to ASTM B145-5A



125S
125T



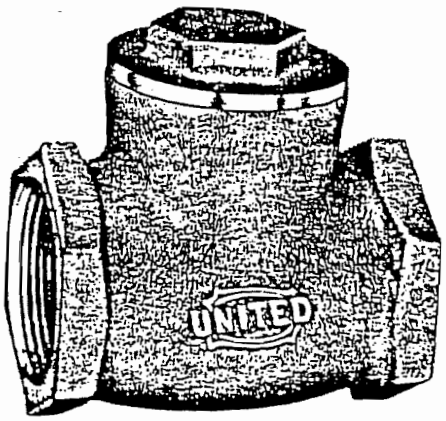
	Size	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
No. 125S 125T	A	1 3/4"	1 27/32"	2 7/32"	2 15/32"	2 31/32"	3 9/16"	4 1/16"	4 11/16"
	B	1 3/4"	1 3/4"	2 1/32"	2 3/8"	2 3/4"	3"	3 23/32"	3 23/32"
	C (Closed)	3 1/16"	3 1/8"	3 1/4"	3 1/2"	4"	4 3/4"	5 1/2"	7"
	Ship Wt. (lbs.)	.44	.56	.80	1.00	1.81	2.57	3.69	5.88
No. 126S 126T	A	27/32"	15/16"	1 3/32"	1 7/32"	1 15/32"	1 3/4"	2"	2 11/32"
	B	1 3/4"	1 3/4"	2 1/32"	2 3/8"	2 3/4"	3"	3 23/32"	3 23/32"
	C (Closed)	2 3/4"	3"	3 1/4"	3 5/8"	4"	4 1/2"	5 1/4"	6 1/2"
	Ship Wt. (lbs.)	.44	.56	.69	.94	1.76	2.5	3.26	5.32
	Quan. Unit Pack	12	12	12	6	6	4	2	2
	Quan.								



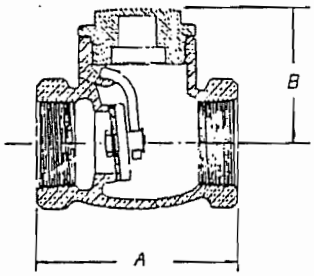
SWING CHECK VALVES

Not recommended for pulsating or vibrating service.

200 lbs. WOG
100% Pressure Tested
Screwed Ends
Replaceable Rubber Disc
(Not recommended for steam)
Sizes: 1/4" - 2"
Body Material: Bronze Conforming to ASTM B145-5A

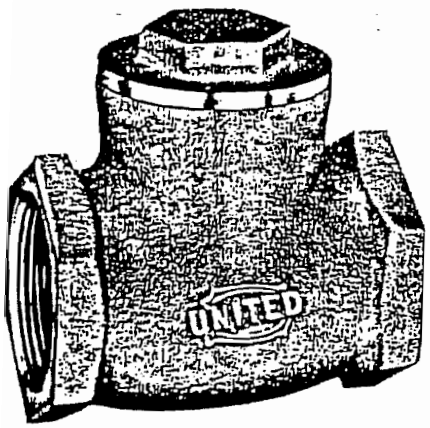


99S



Install horizontally or vertically with flow in upward direction. Do not install laying on side. Keep seal clean.

Size	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
A	1 57/64"	1.57/64"	2 9/64"	2 33/64"	3 1/32"	3 29/64"	3 13/16"	4 7/16"
B	1 7/32"	1 7/32"	1 9/32"	1 17/32"	2 1/16"	2 13/64"	2 31/64"	2 55/64"
Ship Wt. (lbs.)	.45	.45	.58	.81	1.22	1.81	2.41	3.42
Quan. Unit Pack	12	12	12	12	6	6	4	4
Quan. Per Case	60	60	60	60	30	18	12	12



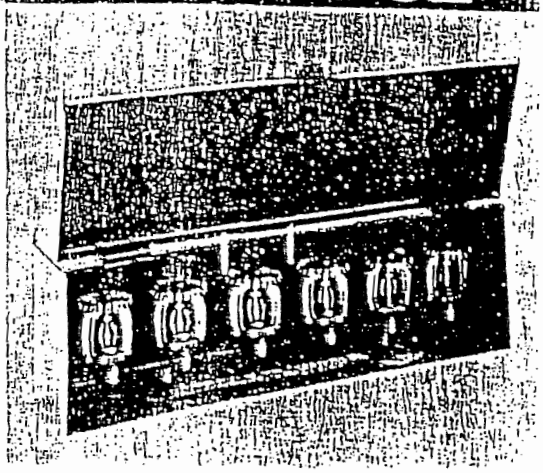
99T

125 lbs. WSP
200 lbs. WOG
100% Pressure Tested
Screwed Ends
Teflon® Disc
Body Material: Bronze conforming to ASTM B145-5A
Sizes 1/4" - 2"

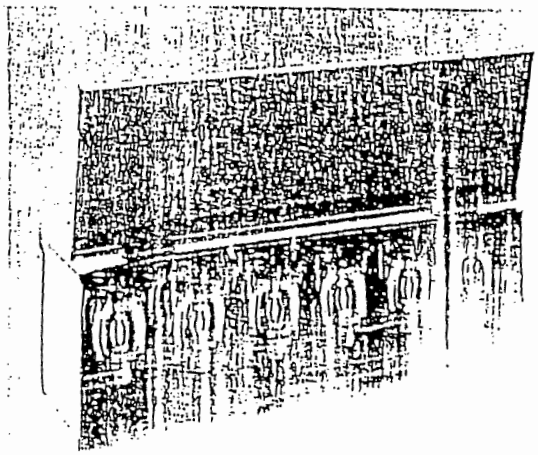
For Replaceable Disk See Page 52

CENTRAL HdrCabT 1-92

Sprinkler Head Cabinet



Central Sprinkler Company
451 North Cannon Avenue, Lansdale, Pennsylvania 19446



Product Description

Central Sprinkler Head Cabinets are constructed of a metal enclosure with a triple-hinged cover designed to provide on-site storage of an emergency supply of sprinkler heads and a sprinkler head wrench.

NFPA 13 requires a representative number of each type of sprinkler head used in a sprinkler system to be stored in a cabinet on-site to allow for immediate removal and replacement of sprinklers which may have operated or become damaged.

Central Sprinkler Head Cabinets are manufactured of heavy gauge steel with knock-outs to accommodate either 1/2" or 3/4" N.P.T. threaded sprinkler heads and are painted an attractive red enamel. They are available in six (6) or twelve (12) head capacity.

Technical Data

Model: Sprinkler Head Cabinet

Style: 6 head or 12 head

Standard Finish: Red enamel

Mfgr. Source: Non-domestic

Capacity: 6 sprinkler heads
12 sprinkler heads

Dimensions:

6 head - 5" high x 14" long x 3 1/4" deep

12 head - 5" high x 14" long x 4" deep

Weight: 6 head - 2.3 lbs.
12 head - 3.5 lbs.

6 Head
12 Head
Sprinkler Head Cabinet

CROKER

HOSE VALVES

5100 SERIES

GATE VALVES 200 LB. & 300 LB. RATED

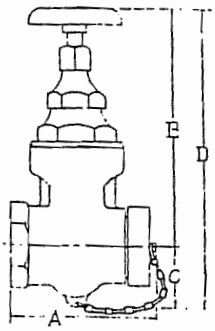


5130

Straightway pattern hose gate valves are intended for use on standpipes, fire pumps and hydrants.

FEMALE X MALE

STANDARD EQUIPMENT: Female NPT inlet X Male hose thread outlet, cast brass with wheel handle, solid wedge disc with tapered seats.



NOTE:

Fig. No. 5110 – 1½ X 1½ – non-rising stem
Fig. No. 5115 – 2½ X 2½ – rising stem
Fig. No. 5120 – 3 X 2½ – rising stem
Fig. No. 5125 – 3 X 3 – rising stem
Fig. No. 5130 – 2½ X 2½ – non-rising stem

OPTIONAL FINISHES:

PB – Polished Brass
RC – Rough Chrome Plated
PC – Polished Chrome Plated

SPECIFY THREAD

Figure No.	Size Fem. X Male	U/L Listed	Max. P.S.I.	A	B Closed	C	D Closed	D Open
5110	1½X1½"	No	200	4½"	6"	1½"	7¼"	7¼"
5115	2½X2½"	No	200	6½"	12½"	2½"	15"	17½"
5120	3X2½"	Yes	300	7"	12½"	2⅝"	15⅛"	18"
5125	3X3"	Yes	300	8¼"	14⅜"	3"	17⅜"	20⅞"
5130	2½X2½"	Yes	300	6½"	10¾"	2½"	13¼"	13¼"

NOT RECOMMENDED FOR WET SYSTEMS

GATE VALVES 300 LB. RATED

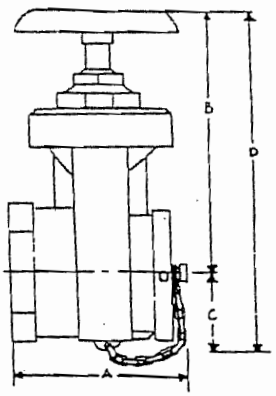


5135

Straightway pattern, non-rising stem, 300 lb. p.s.i. hose gate valves are intended for use on standpipes, fire pumps and hydrants

FEMALE X MALE

STANDARD EQUIPMENT: Female NPT inlet X Male hose thread outlet, cast brass with wheel handle, solid wedge disc with tapered seats.



NOTE:

Figure No. 5135 – 2½ X 2½" size
Figure No. 5140 – 3 X 2½" size

U/L LISTED & FM APPROVED

OPTIONAL FINISHES:

PB – Polished Brass
RC – Rough Chrome Plated
PC – Polished Chrome Plated

SPECIFY THREAD

Figure No.	Size Fem. X Male	A	B	C	D
5135	2½X2½"	5⅛"	7⅝"	2¼"	9⅞"
5140	3X2½"	5⅛"	7⅝"	2¼"	9⅞"

NOT RECOMMENDED FOR WET SYSTEMS

PRESSURE RESTRICTING ANGLE VALVES — 175 LB. RATED



5050-5055

Adjustable restriction of pressures up to 300 lbs. When valve is opened against link and additional pressure is required, link can be broken and the valve opened completely.

Fire Dept. Valves
FEMALE X MALE

STANDARD EQUIPMENT: Female NPT inlet X Male hose thread outlet cast brass valve with wheel handle.

Fire Hose Rack Assembly Valves
DOUBLE FEMALE

STANDARD EQUIPMENT: Female NPT inlet and outlet cast brass valve with wheel handle.

OPTIONAL FINISHES:
PB — Polished Brass
RC — Rough Chrome Plated
PC — Polished Chrome Plated



5060-5062

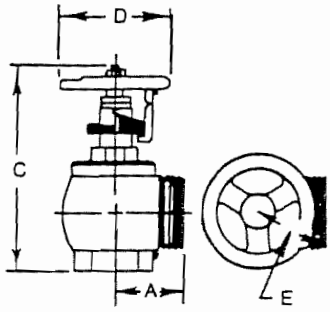
Fig. No.	Size
5050	1½"
5055	2½"

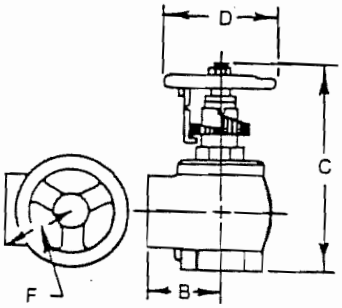
SPECIFY THREAD

Fig. No.	Size
5060	1½"
5062	2½"

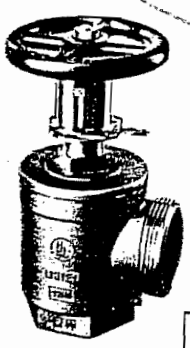
U/L LISTED
NY BOARD OF STANDARDS & APPEALS APPROVED

	Female X Male		Double Female	
Fig. No.	5050	5055	5060	5062
Size	1½"	2½"	1½"	2½"
A	$2\frac{11}{64}$	$3\frac{3}{16}$	—	—
B	—	—	$2\frac{11}{64}$	$3\frac{3}{16}$
C-CLO.	$6\frac{3}{8}$	$9\frac{17}{32}$	$6\frac{3}{8}$	$9\frac{17}{32}$
C-OP.	$7\frac{13}{32}$	$11\frac{15}{32}$	$7\frac{13}{32}$	$11\frac{15}{32}$
D	$3\frac{3}{4}$	5	$3\frac{3}{4}$	5
E	$2\frac{15}{32}$	$3\frac{9}{16}$	—	—
F	—	—	$2\frac{15}{32}$	$3\frac{9}{16}$





PRESSURE RESTRICTING ANGLE VALVES — 175 LB. RATED



5064-5066

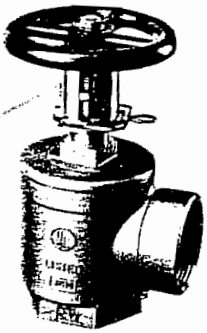
Adjustable restriction of pressures up to 300 lbs. Locking pin device restricts full opening of valve by untrained personnel, pin may be removed by firefighters to allow full open valve.

Fire Dept. Valves
FEMALE X MALE

STANDARD EQUIPMENT: Female NPT inlet X Male hose thread outlet cast brass valve with wheel handle.

Fire Hose Rack Assembly Valves
DOUBLE FEMALE

STANDARD EQUIPMENT: Female NPT inlet and outlet cast brass valve with wheel handle.



5068-5070

SPECIFY THREAD

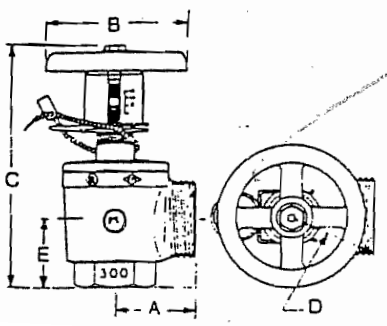
OPTIONAL FINISHES:
PB — Polished Brass
RC — Rough Chrome Plated
PC — Polished Chrome Plated

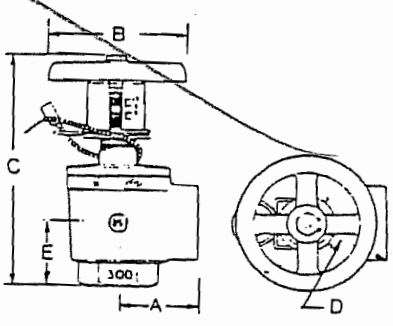
Fig. No.	Size
5064	1½"
5066	2½"

Fig. No.	Size
5068	1½"
5070	2½"

U/L LISTED — FM APPROVED

Figure No.	5064 5068	5066 5070
Size	1½"	2½"
A	2¼"	3½"
B	2¼"	3½"
C-CLO.	6¾"	9⅝"
C-OPN.	7⅝"	10⅞"
D	4"	5"
E	2¾"	3½"
F	2¾"	3½"





7200 SERIES ADAPTERS AND BUSHINGS CROKER

HEX ADAPTERS

DOUBLE MALE

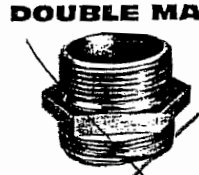


Figure No. 7201 — Cast Brass
Sizes: 1½" x 1" 1½" x 1½"
2" x 1" 2" x 1½"
2" x 2" 2½" x 1½"
2½" x 2" 2½" x 2½"
3" x 2½" 3" x 3"

Figure No. 7212 — Cast Aluminum
Size: 2½" IPT X 2½" NYT (only)

DOUBLE FEMALE



Figure No. 7215 — Cast Brass
Sizes: 1½" x 1½"
2" x 2"
2½" x 2½"
3" x 3"

FEMALE x MALE



Figure No. 7220 — Cast Brass
Sizes: 1½" x 1" 1½" x 1½"
2" x 1" 2" x 1½"
2" x 2" 2½" x 1½"
2½" x 2" 2½" x 2½"
3" x 2½" 3" x 3"

ADAPTERS - PIN LUG OR ROCKER LUG

DOUBLE MALE

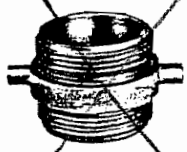


Figure No. 7230 — Cast Brass
Sizes: 1½" x 1½"
2" x 2"
2½" x 2½"
3" x 3"

DOUBLE FEMALE



Figure No. 7235 — Cast Brass
Sizes: 1½" x 1½"
2" x 2"
2½" x 2½"

FEMALE x MALE



Figure No. 7240 — Cast Brass
Sizes: 1½" x 1½"
2" x 2"
2½" x 2½"

FEMALE x MALE REDUCER
PIN LUG OR ROCKER LUG



Figure No. 7245 — Cast Brass
Sizes: 1½" x ¾" 2½" x 1"
1½" x 1" 2½" x 1½"
2" x 1½" 2½" x 2"
2½" x ¾" 3" x 2½"

FEMALE x MALE INCREASER
PIN LUG OR ROCKER LUG



Figure No. 7255 — Cast Brass
Sizes: 1" x 1½" 2" x 2½"
1½" x 2" 2½" x 3"
1½" x 2½"

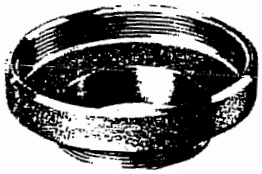
FEMALE x MALE BUSHING



Figure No 7265 — Cast Brass
Sizes: 1" x 1½" 1½" x 2½"
1" x 2" 2" x 2½"
1½" x 2" 2" x 3"
1" x 2½" 2½" x 3"

OPTIONAL FINISHES
PB— Polished Brass RC— Rough Chrome Plated
PC— Polished Chrome Plated

Other sizes available upon request.



FEMALE x MALE BUSHING

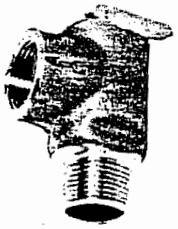
Figure No. 7280 — Cast Brass
Size: 6" X 4" NPT (Only)

660-5770 SERIES — PRESSURE RELIEF VALVES VALVE ACCESSORIES — CROKER

PRESSURE RELIEF VALVE

or use on all closed systems to prevent damage in the event a malfunction due to some foreign object or matter becoming lodged in an automatic regulating or control valve. eaturing a pop-type relief action for maximum performance.

Available settings 15 thru 175 p.s.i.



5660

STANDARD EQUIPMENT cast brass body. Available with ¾" Male or ¾" Female inlet, with ¾" Female outlet.

SPECIFY MALE OR FEMALE INLET

Figure No.	Press. Set (PSI)	Dimensional Data (Inches)				
		Inlet	Outlet	A	B	C
5660	15 - 175	¾	¾	3	1	1

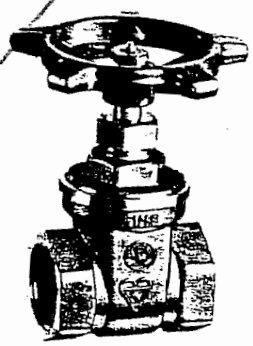
GATE VALVES

NON-RISING STEM
200 LB. WOG

STANDARD EQUIPMENT: Wedge Disc style valve with forged brass body. Red wheel handle. Double Female screwed ends NPT.

OPTIONAL: Solder ends

Fig. No.	Size
5670	½"
5671	¾"
5672	1"
5673	1¼"
5674	1½"
5675	2"
5676	2½"
5677	3"



5670

CAPS AND CHAINS

Used to cover and protect male outlet threads on valves and hydrants. Prevents entry of foreign matter.

CAST BRASS WITH CHAIN

Fig. No. with Pin Lugs	Size	Fig. No. with Rocker Lugs
5705	¾"	5706
5707	1"	5708
5709	1½"	5710
5711	2"	5712
5713	2½"	5714
5715	3"	5716
5717	4"	5718



OPTIONAL FINISHES
PB — Polished Brass
RC — Rough Chrome Plated
PC — Polished Chrome Plated

CAST HARDCOATED ALUMINUM CAP WITH CHAIN		PLASTIC CAP WITH CHAIN	
Fig. No.	Size	Fig. No.	Size
5720	2½"	5722	2½"

Approved NYC Board

VALVE ESCUTCHEONS

Used to trim pipe entry into cabinet.

Fig. No.	Size	Material
5730	1½"	Stamped Steel Cadmium Plated
5735	2½"	Stamped Steel Cadmium Plated
5740	1½"	Stamped Brass
5745	2½"	Stamped Brass

Fig. No.	Size	Material
5750	1½"	Cast Brass
5755	2½"	Cast Brass

OPTIONAL FINISHES: PB — Polished Brass
RC — Rough Chrome Plated
PC — Polished Chrome Plated

SPECIFY FIGURE NO.—SIZE—FINISH

WALL FLANGES

For use with gate valves.

STANDARD EQUIPMENT: Cast brass with set screw.

OPTIONAL FINISHES:
PB — Polished Brass
RC — Rough Chrome Plated
PC — Polished Chrome Plated

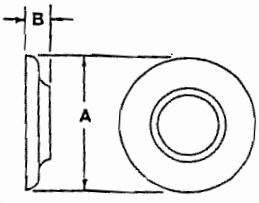
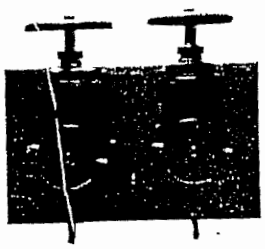


Figure No.	Valve Size	Dimensions	
		A	B
5765	2½"	5½"	1"
5770	3"	6"	1"

CROKER FIRE PUMP TEST CONNECTIONS 6800 SERIES

FLUSH TYPE

Provides means to test fire pump flow rate. Number of outlets contingent upon rated G.P.M. of fire pump. Each individual outlet capable of 250 G.P.M. minimum discharge and controlled by a gate valve.

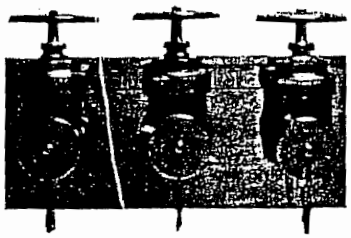


6802

STANDARD EQUIPMENT: Cast brass end inlet body, size and number of outlets as selected by figure number; brass plate; with 3" Fem. NPT inlet x 2½" Male Hose Thread outlet cast brass gate valve and cap with chain. **SPECIFY THREAD and FINISH.**

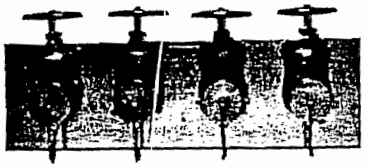
BRANDING: 'Fire Pump Test."

OPTIONAL FINISHES:
PB – Polished Brass
RC – Rough Chrome Plated
PC – Polished Chrome Plated

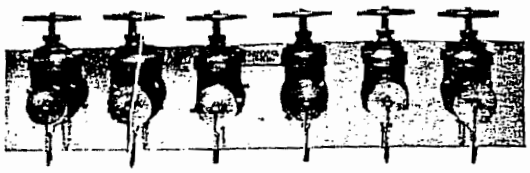


6805-6806

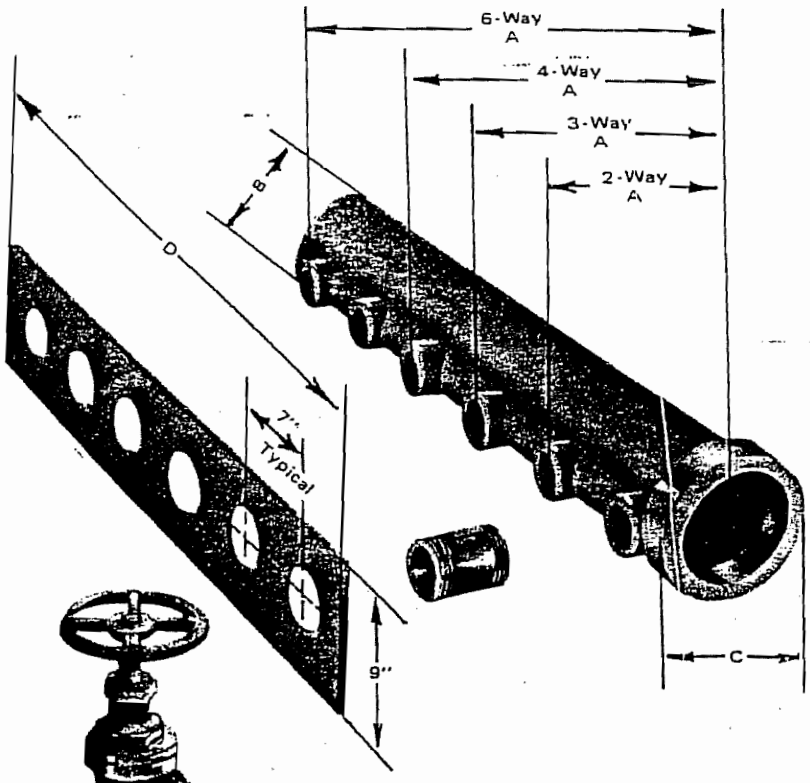
Fig. No.	Pump GPM	Pipe Size	No. of Outlets	A	B	C	D
6802	500	4"	2	15¼	5	6	16
6805	750	5"	3	22¼	6	6¾	23
6806	750	6"	3	28¾	7½	7⅝	23
6807	1000	6"	4	28¾	7½	7⅝	30
6808	2000	8"	6	43	7½	9 9/16	44

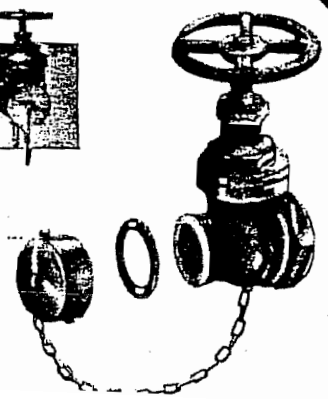


6807



6808





6625 SERIES FIRE DEPT. OUTLET CONNECTIONS CROKER

EXPOSED TYPE WALL HYDRANT



6625-6627
(6629 not shown)

An Auxiliary Outlet Connection for Fire Dept. Use.

STANDARD EQUIPMENT: Cast brass body, wall plate, and caps with chains. **SPECIFY THREAD.**

BRANDING: "Wall Hydrant"

OPTIONAL FINISHES:
PB — Polished Brass
RC — Rough Chrome Plated
PC — Polished Chrome Plated

Fig. No.	Size	Type
6625	4X2½X2½	2-Way
6627	6X2½X2½	2-Way
6629	6X2½X2½X2½	3-Way

FREE STANDING TYPE HYDRANT



6630-6632
(6634 not shown)

Brass Body — Overall Height: 24"

A Free Standing Auxiliary Outlet Connection for Fire Dept. Use

STANDARD EQUIPMENT: Cast brass bottom inlet body with 18" high brass seamless tubing; brass branded plate; cast brass caps and chains. **SPECIFY THREAD.**

BRANDING: " Hydrant"

OPTIONAL FINISHES:
PB — Polished Brass
RC — Rough Chrome Plated
PC — Polished Chrome Plated

Fig. No.	Size	Type
6630	4X2½X2½	2-Way
6632	6X2½X2½	2-Way
6634	6X2½X2½X2½	3-Way

FLUSH HYDRANT CONTROL VALVE



6640
Square Plate



6641
Round Plate

Wall Type with Round or Square Plate

A device to operate non-rising stem supply gate valve from remote location.

STANDARD EQUIPMENT: Polished brass 7" round or square plate, as selected by figure number, threaded 1½" female NPT on back and 2½" male NST on front, with cap and chain. 24" long x ⅞" square steel extension rod with coupling for attachment to stem of gate valve.

BRANDING:
"Control Valve" on Round Plate
"Wall Hydrant Control" on Square Plate

OPTIONAL FINISH:
PC—Polished Chrome Plated

Typical Wall Type Installation

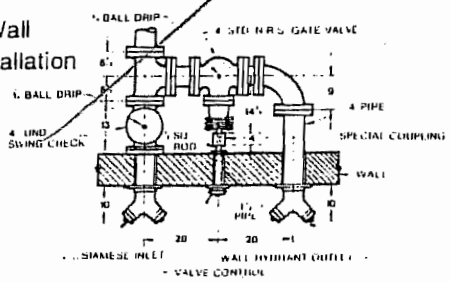




Fig. No. 6643
Wrench
For Control Units

FREE STANDING HYDRANT CONTROL VALVE



6642

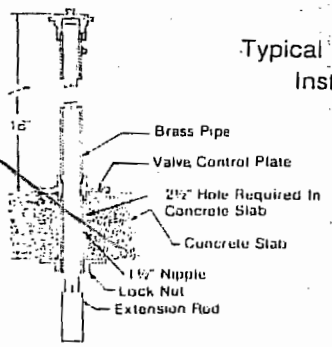
A device to operate non-rising stem supply gate valve from remote location

STANDARD EQUIPMENT: Polished brass round branded base plate, threaded 1½" NPT on bottom side with brass sleeve and cap and chain. 30" long x ⅞" square steel extension rod with coupling for attachment to stem of below grade gate valve.

BRANDING: "Control Valve"

OPTIONAL FINISH:
PC — Polished Chrome Plated

Typical Vertical Installation



City of Aurora
Building Codes Division
15151 E Alameda Pkwy
Aurora, CO 80012
(303) 739-7420

Notice

This material is subject to copyright protection pursuant to Federal Law: 17 United States Code Section 106.

NON-ADJUSTABLE/FACTORY SET IN-LINE AUTOMATIC PRESSURE REGULATING VALVES

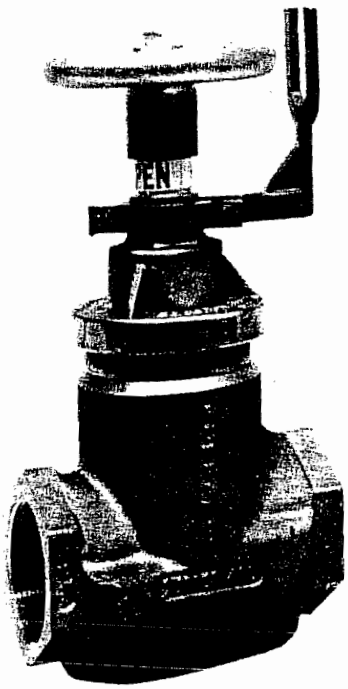
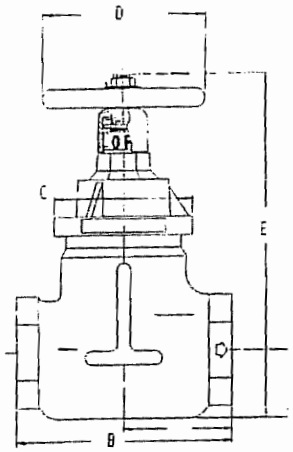


Figure No. 5595

U/L LISTED



2 1/2" IN LINE VALVE:

Underwriters Laboratory Listed at 400 PSI

Underwriters Laboratory Listed as a Checking Device

Regulates pressure under flow (residual) no flow (static) conditions.

Tamper proof.

For use with automatic sprinkler systems.

Available with switch bracket for mounting supervisory switch.

Furnished standard with visual indicator for on-off inspection.

Will reduce inlet pressure of 400 PSI. or less to desired outlet pressure of 20 PSI or more.

SETTING INFORMATION REQUIRED:

AUTOMATIC SPRINKLER SYSTEMS
GPM, STATIC AND RESIDUAL
INLET AND OUTLET

STANDARD EQUIPMENT:

Cast brass valve with female NPT inlet X female NPT outlet. Aluminum handwheel. Available grooved inlet X grooved outlet.

OPTIONAL:
RC - Rough Chrome Plated
VN - Visual Indicator
SB - Switch Bracket

Figure No. 5590- Double Female NPT
Figure No. 5595- Double Female NPT with Visual Indicator and Switch Bracket
Figure No. 5597- Grooved X Grooved with Visual Indicator and Switch Bracket.

Size	A	B	C	D	E-Open	E-Closed
2 1/2"	3 7/8"	7 3/4"	5 3/4"	7 1/2"	12 3/4"	12 3/16"

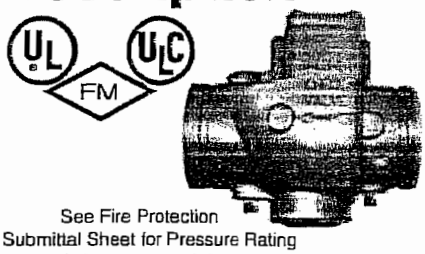
Note add 1" to the B dimension for Grooved X Grooved

tyco / Fire & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500
www.tyco-fire.com

Tyco Fire Products Model CV-1F Check Valve

General Description



See Fire Protection Submittal Sheet for Pressure Rating and Listing/Approval Information

The Model CV-1F Fire Protection Check Valve is furnished with grooved ends and can be installed using grooved couplings. The Model CV-1F can be installed with ANSI class 150 Flanges utilizing Grinnell Figure 71 flange adapters and also ANSI class 300 Flange Adapters. All Model CV-1F Check Valves have been designed with a removable cover for ease of field maintenance. Valves installed horizontally or inclined (flow up or down) are to be positioned with the cap facing up. Valves installed vertically may be positioned with flow up or down.

A Maintenance Check Valve Kit is available to allow the maintenance procedure of backflushing through the fire department connection without removing the Model CV-1F Check Valve from the pipe line.

The Model CV-1F Check Valves are a redesignation for the Central Figure 590F and Grinnell Figure 590F.

WARNING

The Model CV-1F Check Valve described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. ***Failure to do so may impair the performance of this device.*** *The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.*

Technical Data

Model: CV-1F
Sizes: 2", 2½", 76.1mm, 3", 4", 139.7mm, 5", 165.1mm, 6", 8", 10" and 12"
Max. Working Pressure: 300 psi (2068 kPa)
Factory Hydro Test: 100% at 600 psi (4137 kPa)
- Seat and shell complies with test requirements of MSS SP-71, UL, FM and ULC

Approvals: UL, FM and ULC;
See Fire Protection Submittal Sheet for exact Listing / Approval information.
Body and Cap: Ductile iron conforming to ASTM A-536, Grade 65-45-12
Clapper: Stainless Steel (2" - 8") or Ductile Iron (10" and 12")
Seal: Grade "E" EPDM
Protective Coatings: Valve assembly
- Non-lead paint

Ordering Procedure

When placing an order, indicate the full product name. Please specify the quantity, valve model number, size, type of seal, Grade "E" EPDM, and part number from the following list.

Valve Size	Valve Part Number
2"	59-590-0-020
2½"	59-590-0-025
76.1mm	59-590-0-076
3"	59-590-0-030
4"	59-590-0-040
139.7mm	59-590-0-139
5"	59-590-0-050
165.1mm	59-590-0-165
6"	59-590-0-060
8"	59-590-0-080
10"	59-590-0-100
12"	59-590-0-120

Tyco Fire Products, valves, accessories and other products are available throughout the U.S., Canada, and internationally, through a network of distribution centers. You may write directly or call 215-362-0700 for the distributor nearest you.

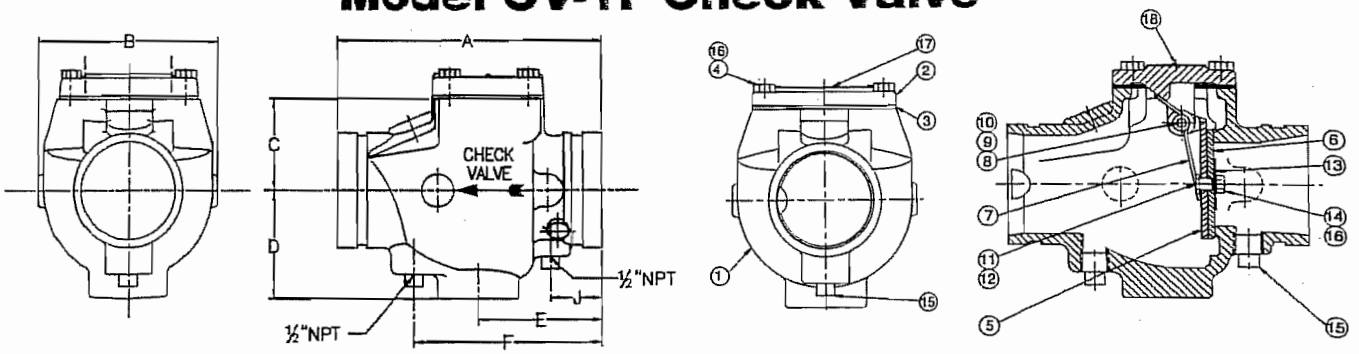
Limited Warranty

Products manufactured by Tyco Fire Products are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by Tyco Fire Products. No warranty is given for products or components manufactured by companies not affiliated by ownership with Tyco Fire Products or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association (NFPA), and/or the standards of any other Authorities Having Jurisdiction. Materials found by Tyco Fire Products to be defective shall be either repaired or replaced, at Tyco Fire Products' sole option. Tyco Fire Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire Products shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

IN NO EVENT SHALL TYCO FIRE PRODUCTS BE LIABLE, IN CONTRACT, TORT, STRICT LIABILITY OR UNDER ANY OTHER LEGAL THEORY, FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LABOR CHARGES, REGARDLESS OF WHETHER TYCO FIRE PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE PRODUCTS' LIABILITY EXCEED AN AMOUNT EQUAL TO THE SALES PRICE.

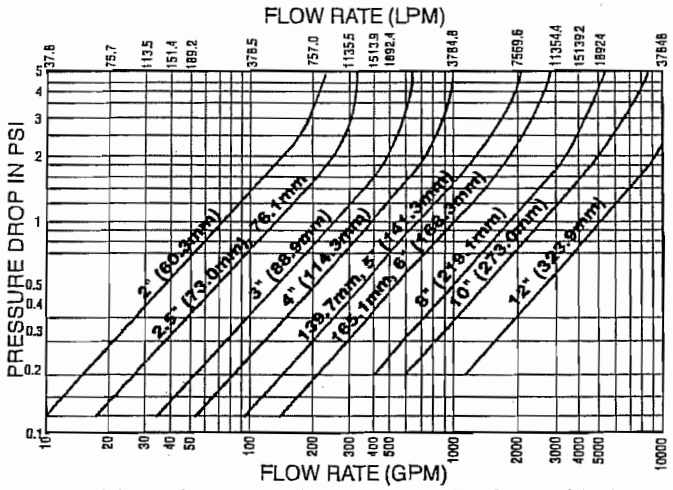
THE FOREGOING WARRANTY IS MADE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Model CV-1F Check Valve



Nominal Dimensions									Approx.
Size	A	B	C	D	E	F	J	Cover	Weight
Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Bolt Torq.	lbs.
mm	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*Lb.-ft./Nm*	*Kg.*
2"	6.75	4.38	2.55	2.57	3.25	4.75	1.62	15	9.0
60.3	*171.5*	*111.3*	*64.8*	*65.3*	*82.3*	*120.7*	*41.5*	*21*	*4.5*
2½"	8.00	5.80	3.41	3.40	3.88	6.00	1.70	39	10.0
73.0	*203.2*	*147.3*	*86.6*	*86.4*	*98.6*	*152.4*	*43.2*	*54*	*4.5*
76.1mm	8.00	5.80	3.41	3.40	3.88	6.00	1.70	39	10.00
	203.2	*147.3*	*86.6*	*86.4*	*98.6*	*152.4*	*43.2*	*54*	*4.5*
3"	8.37	5.76	3.60	3.40	3.88	6.00	1.70	39	11.0
88.9	*212.6*	*1.46.3*	*91.4*	*86.4*	*98.6*	*152.4*	*43.2*	*54*	*5.0*
4"	9.63	6.74	4.61	3.63	4.56	7.13	1.84	39	25.0
114.3	*244.6*	*171.2*	*117.1*	*92.2*	*115.1*	*181.1*	*46.7*	*54*	*11.3*
139.7mm	10.50	7.50	5.29	4.20	4.90	7.60	1.90	39	29.0
	266.7	*190.5*	*134.4*	*106.7*	*124.5*	*193.0*	*48.3*	*54*	*13.2*
5"	10.50	7.50	5.29	4.20	4.90	7.60	1.90	39	29.0
141.3	*266.7*	*190.5*	*134.4*	*106.7*	*124.5*	*193.0*	*48.3*	*54*	*13.2*
165.1mm	11.50	80.5	5.75	4.50	5.00	7.60	1.48	60	47.0
	292.1	*204.5*	*146.1*	*114.3*	*127.0*	*193.0*	*37.6*	*82*	*21.3*
6"	11.50	8.05	5.75	4.50	5.00	7.60	1.48	60	47.0
168.3	*292.1*	*204.5*	*146.1*	*114.3*	*127.0*	*193.0*	*37.6*	*82*	*21.3*
8"	14.00	10.25	7.75	5.62	5.45	8.40	2.20	120	66.0
219.1	*355.6*	*260.4*	*196.9*	*142.7*	*138.4*	*213.4*	*58.9*	*164*	*29.9*
10"	18.00	13.00	10.21	6.38	7.50	10.50	3.00	120	109.7
273.0	*457.2*	*330.2*	*259.3*	*162.1*	*190.5*	*266.7*	*76.2*	*164*	*49.4*
12"	21.0	14.28	11.31	7.26	7.62	10.62	2.75	120	151.0
323.9	*533.4*	*362.7*	*287.2*	*184.4*	*193.5*	*269.7*	*69.9*	*164*	*68.0*

Detail	Part	Material	Qty.
1	Body	Ductile Iron	1
2	Cap	Ductile Iron	1
3	Gasket	Synthetic Fiber	1
4	Hex Cap Screw	Steel, Zinc Plated	AR
5	Clapper	Stainless Steel or Ductile Iron	1
6	Seal Facing	EPDM Grade "E"	1
7	Spring	Stainless Steel	1
8	Hinge Shaft	Stainless Steel	1
9	Retaining Ring	Stainless Steel	AR
10	Washer	Teflon	2
11	Retention Bolt	Stainless Steel	1
12	Seal Ring	Neoprene	1
13	Retaining Disc	Stainless Steel	1
14	Locknut	Stainless Steel	1
15	Plug-½"-14 NPT	Cast Iron	2
16	Adhesive	Thread Sealer	AR
17	Nameplate	Aluminum	1
18	Rivet	Steel	2



Note: It is good piping practice to apply a safety factor of 15% to 20% to the values in the above table for design purposes.

Care and Maintenance

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in accordance with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. The installing contractor or product manufacturer should be contacted relative to any questions. Any impairment must be immediately corrected. It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service.

General Notes: It is the Designer's responsibility to select products suitable for the intended service and to ensure that pressure ratings and performance data is not exceeded. Always read and understand the installation instructions (IH-1000). Never remove any piping component or correct or modify any piping deficiencies without first depressurizing and draining the system. Material and gasket selection should be verified to be compatible for the specific application.

ISO 9001 Certified Company

tyco / Fire & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500

Series DS-1 — 5.6 K-factor Dry Type Sprinklers Quick Response, Standard Coverage

General Description

The Series DS-1, 5.6 K-factor, Quick Response, Standard Coverage, Dry Type Sprinklers are decorative 3 mm glass bulb automatic sprinklers designed for the following typical uses:

- where pendent sprinklers are required on dry pipe systems that are exposed to freezing temperatures (e.g. sprinkler drops from unheated portions of buildings)
- where sprinklers and/or a portion of the connecting piping may be exposed to freezing temperatures (e.g. sprinkler drops from wet systems into freezers, sprinkler sprigs from wet systems into unheated attics, or horizontal piping extensions through a wall to protect an unheated area of a building)
- where sprinklers are used on systems that are seasonably drained to avoid freezing (e.g. vacation resort areas)

WARNINGS

The Series DS-1 Dry Type Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. ***Failure to do so may impair the performance of these devices.***

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.

The Series DS-1 Dry Type Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section.

IMPORTANT

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

Model/Sprinkler Identification Numbers

TY3235 - (Pendent)
TY3135 - (Upright)
TY3335 - (Horizontal Sidewall)

Technical Data

Approvals
UL and C-UL Listed.
FM and NYC Approved.
(Refer to Table A)

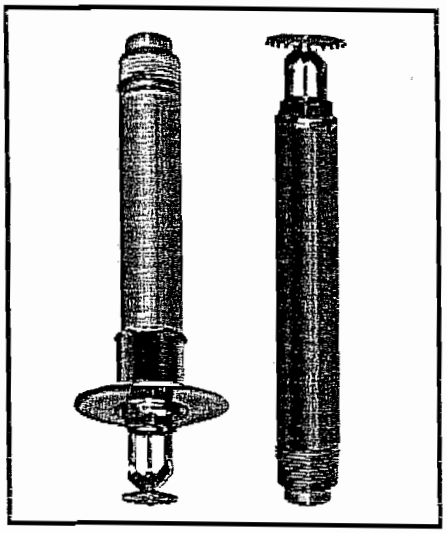
Maximum Working Pressure
175 psi (12,1 bar)

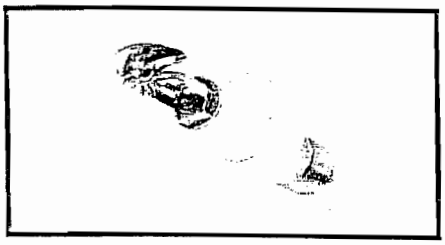
Inlet Thread Connection
1 inch NPT (Standard Order)
ISO 7-R1

Discharge Coefficient
K = 5.6 GPM/psi$^{1/2}$
(80,6 LPM/bar$^{1/2}$)

Temperature Ratings
Refer to Table A

Finishes
Sprinkler: Natural Brass, Chrome Plated, White Polyester
Escutcheon: White Coated or Chrome Plated





Physical Characteristics

Inlet	Copper
Plug	Copper
Yoke	Stainless Steel
Casing	Galvanized Carbon Steel
Insert	Bronze
Bulb Seat	Stainless Steel
Bulb	Glass
Compression Screw	Bronze
Deflector	Bronze
Frame	Bronze
Guide Tube	Stainless Steel
Water Tube	Stainless Steel
Spring	Stainless Steel
Sealing Assembly	Beryllium Nickel w/Teflon*
Escutcheon	Carbon Steel

*Registered Trademark of DuPont

Patents
U.S.A. Patent No. 5,188,185

		SPRINKLER FINISH								
		TY3235 Pendent w/ Standard Recessed Escutcheon (Ref. Fig. 3) w/ Wide Flange Recessed Escutcheon (Ref. Fig. 4)			TY3235 Pendent w/ Std. Escutcheon (Ref. Fig. 5) w/ Deep Escutcheon (Ref. Fig. 6) w/o Escutcheon (Ref. Fig. 7) TY3135 Upright w/o Escutcheon (Ref. Fig. 8)			TY3335 Hor. Sidewall with top of Deflector-to-Ceiling distance of 4 to 12 inches (100 to 300 mm) w/ Std. Escutcheon (Ref. Fig. 9) w/ Deep Escutcheon (Ref. Fig. 10) w/o Escutcheon (Ref. Fig. 11)		
Temperature Rating	Bulb Color Code	Natural Brass	Chrome Plated	White Polyester	Natural Brass	Chrome Plated	White Polyester	Natural Brass	Chrome Plated	White Polyester
135°F/57°C	Orange	1, 2, 3, 4		1, 2, 4	1, 2, 3, 4		1, 2, 4	1*, 2*, 3**, 4		1*, 2*, 4
155°F/68°C	Red	1, 2, 3, 4		1, 2, 4	1, 2, 3, 4		1, 2, 4	1*, 2*, 3**, 4		1*, 2*, 4
175°F/79°C	Yellow	1, 2, 3, 4		1, 2, 4	1, 2, 3, 4		1, 2, 4	1*, 2*, 3**, 4		1*, 2*, 4
200°F/93°C	Green	1, 2, 3, 4		1, 2, 4	1, 2, 3, 4		1, 2, 4	1*, 2*, 3**, 4		1*, 2*, 4
286°F/141°C	Blue	N/A			1, 2, 3, 4		1, 2, 4	1*, 2*, 3**, 4		1*, 2*, 4

Notes:
1. Listed by Underwriters Laboratories, Inc (Maximum order length of 48 inches).
2. Listed by Underwriters Laboratories for use in Canada. (Maximum order length of 48 inches).
3. Approved by Factory Mutual Research Corporation (Maximum order length of 48 inches)
4. Approved by the City of New York under MEA 352-01-E.

* Light and Ordinary Hazard Occupancies Only.
** Light Hazard Occupancies Only.
N/A - Not Available.

TABLE A
SERIES DS-1, QUICK RESPONSE - STANDARD COVERAGE, DRY TYPE SPRINKLERS
LABORATORY LISTINGS AND APPROVALS

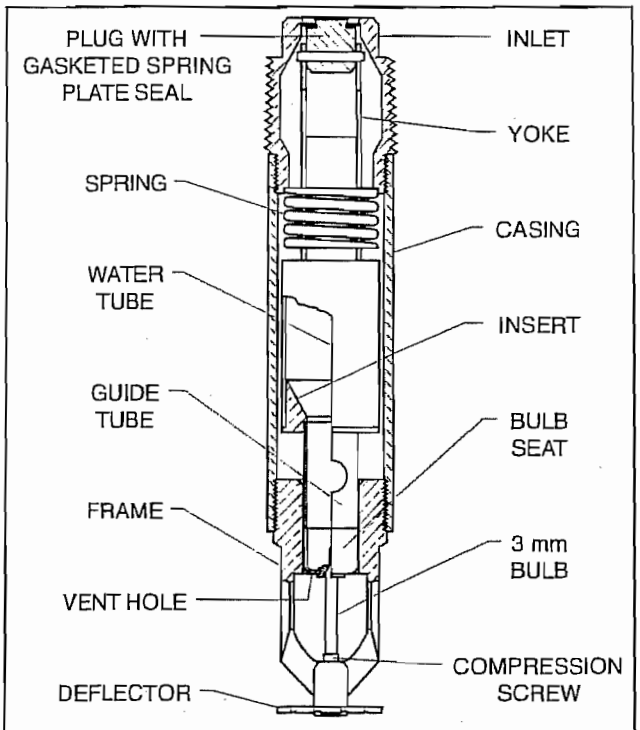


FIGURE 1
SERIES DS-1 QUICK RESPONSE
DRY TYPE SPRINKLER ASSEMBLY

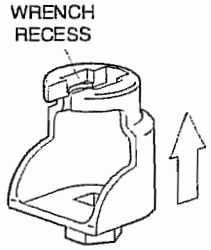


FIGURE 2
W-TYPE 7 SPRINKLER WRENCH

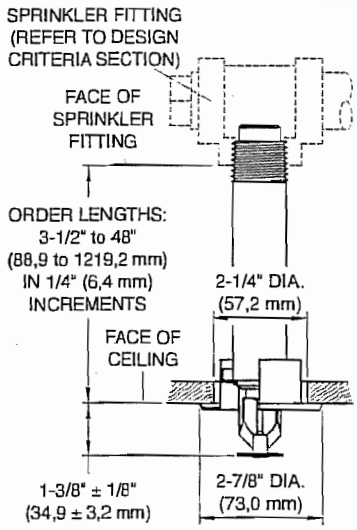


FIGURE 3
TY3235 PENDENT
w/ STANDARD RECESSED
ESCUTCHEON

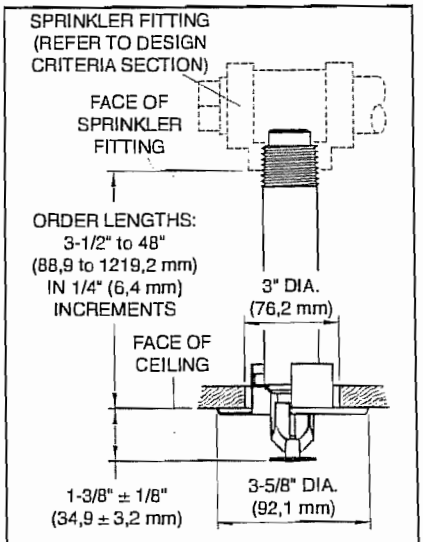


FIGURE 4
TY3235 PENDENT
w/ WIDE FLANGE RECESSED
ESCUTCHEON

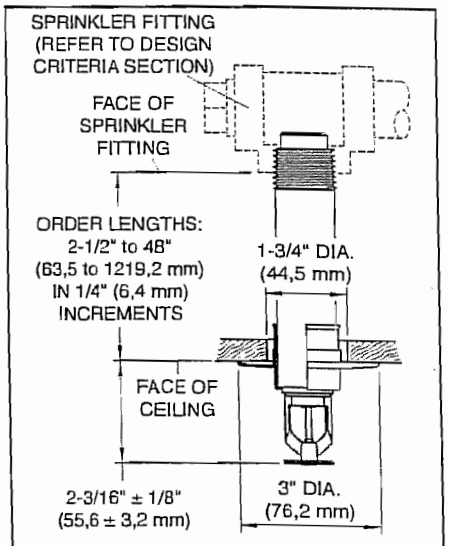


FIGURE 5
TY3235 PENDENT
w/ STANDARD
ESCUTCHEON

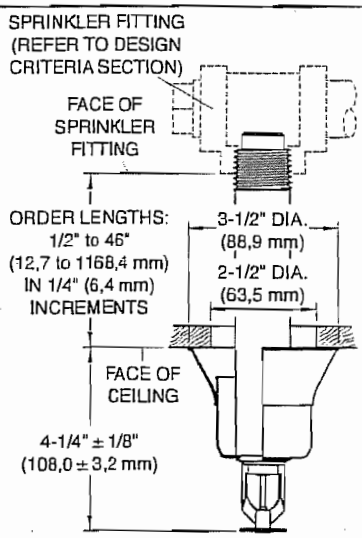


FIGURE 6
TY3235 PENDENT
w/ DEEP ESCUTCHEON

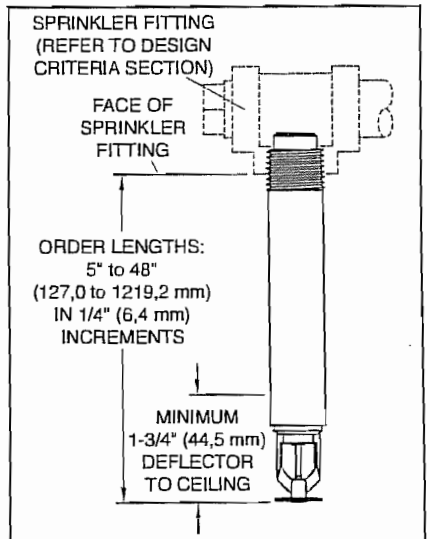


FIGURE 7
TY3235 PENDENT
w/o ESCUTCHEON

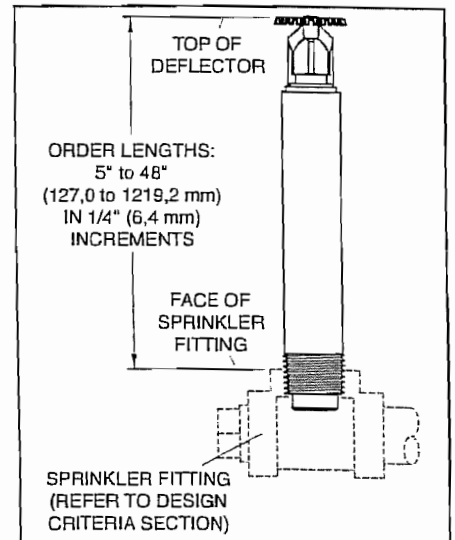


FIGURE 8
TY3135 UPRIGHT
w/o ESCUTCHEON

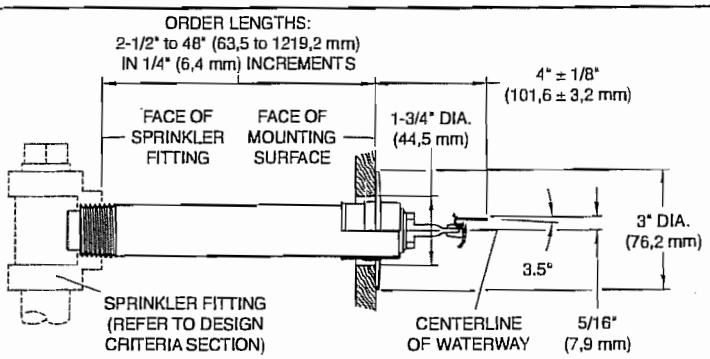


FIGURE 9
TY3335 HORIZONTAL SIDEWALL w/ STANDARD ESCUTCHEON

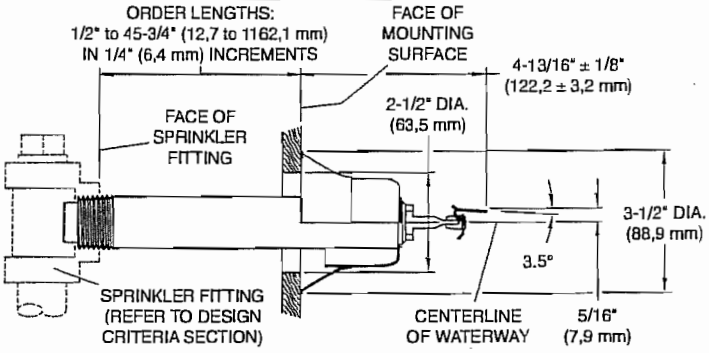


FIGURE 10
TY3335 HORIZONTAL SIDEWALL w/ DEEP ESCUTCHEON

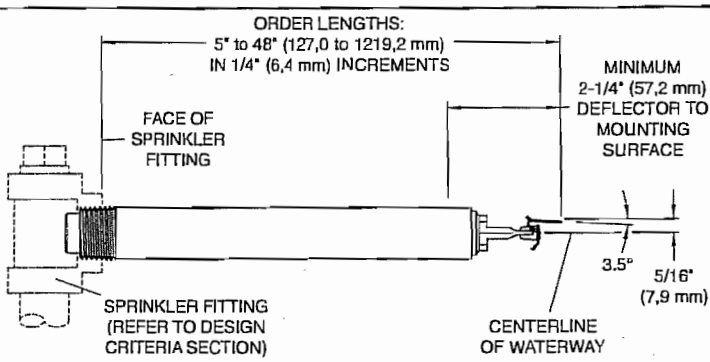


FIGURE 11
TY3335 HORIZONTAL SIDEWALL w/o ESCUTCHEON

Operation

When the Series DS-1 is in service, water is prevented from entering the assembly by the Plug & Belleville Sealing Assembly (Ref. Figure 1) in the Inlet of the Sprinkler. The glass Bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass Bulb, and the Bulb Seat is released. The compressed Spring is then able to expand and push the Water Tube as well as the Guide Tube outward. This action simultaneously pulls inward on the Yoke, withdrawing the Plug & Belleville Seal from the Inlet allowing the sprinkler to activate and flow water.

Design Criteria

The Series DS-1 Sprinklers are intended for use in fire sprinkler systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (e.g., UL Listing is based on NFPA 13 requirements).

The Series DS-1 Dry Type Sprinkler is to be installed in the 1 inch NPT outlet or run of malleable or ductile iron threaded tee fittings that meet the dimensional requirements of ANSI B16.3 (Class 150) or cast iron threaded tee fittings that meet the dimensional requirements of ANSI B16.4 (Class 125) with the end sprinkler fitting on a branch line to be plugged as shown in Figures 3 - 11.

When installing 1 inch NPT Series DS-1 Dry Type Sprinklers on a dry pipe sprinkler system, only use the side outlet of maximum 2-1/2 inch size reducing tee's.

For wet pipe sprinkler systems, the Series DS-1 Dry Type Sprinklers may also be installed in the 1 inch NPT outlet of a Central Figure 730 Mechanical Tee or the following Tyco Fire Products CPVC fittings: (P/N 80145) 1" x 1" NPT Female Adapter or (P/N 80249) 1" x 1" x 1" NPT Sprinkler Head Adapter Tee.

NOTE

Do not install the Series DS-1 into any other type fitting without first consulting the Technical Services Department. Failure to use the appropriate fitting may result in: failure of the sprinkler to properly operate due to formation of ice over the inlet Plug or binding of the inlet Plug; or, insufficient en-

gagement of the inlet pipe threads with consequent leakage.

Branch, cross, and feedmain piping connected to Dry Sprinklers and subject to freezing temperatures must be pitched for drainage in accordance with the minimum requirements of the National Fire Protection Association for dry pipe sprinkler systems.

When Dry Sprinklers are to be used in wet pipe sprinkler systems protecting areas subject to freezing temperatures (e.g., sprinkler drops into freezers), consideration must be given to the appropriate length of the sprinkler that will prevent freezing of the water in the connecting pipes due to conduction. When the temperature surrounding the wet pipe sprinkler system is maintained at a minimum temperature of 40°F/4°C, the following are the minimum recommended lengths between the face of the sprinkler fitting and the outside surface of the protected area (i.e., length exposed to minimum ambient of 40°F/4°C):

- 12 inches (300 mm) when the temperature within the protected area is -20°F/-29°C
- 18 inches (450 mm) when the temperature within the protected area is -40°F/-40°C
- 24 inches (600 mm) when the temperature within the protected area is -60°F/-51°C

For protected area temperatures between those given above, the minimum recommended length from the face of the fitting to the outside of the protected area may be determined by interpolating between the indicated values.

NOTE

When Dry Sprinklers penetrate a ceiling or wall into an area subject to freezing, the clearance space around the Sprinkler Casing must be completely sealed in order to prevent the leakage of moist air into the freezing area which might result in the formation of condensate around the Frame, Deflector, Bulb Seat, or Bulb. Failure to prevent the formation of condensate could result in the build-up of ice around the releasing components. This could result an inadvertent operation of the sprinkler or impaired operation due to reduced thermal sensitivity.

Installation

The Series DS-1 Dry Type Sprinklers must be installed in accordance with the following instructions:

NOTES

The Series DS-1 must only be installed in fittings that meet the requirements of the Design Criteria section.

Refer to the Design Criteria section for other important requirements regarding piping design and sealing of the clearance space around the Sprinkler Casing.

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm) for the 135°F/57°C rating to 1/8 inch (3,2 mm) for the 286°F/141°C rating.

A leak tight 1 inch NPT sprinkler joint should be obtained with a torque of 20 to 30 ft.lbs. (26,8 to 40,2 Nm). Higher levels of torque may distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in an Escutcheon Plate by under- or over-tightening the Sprinkler. Readjust the position of the sprinkler fitting to suit.

Step 1. Pendent sprinklers must be installed only in the pendent position, and upright sprinklers must be installed only in the upright position. The deflector of a pendent or upright sprinkler is to be parallel to the ceiling.

Horizontal sidewall sprinklers are to be installed in the horizontal position with their centerline of waterway perpendicular to the back wall and parallel to the ceiling. The word "TOP" on the Deflector is to face towards the ceiling.

Step 2. With pipe thread sealant applied to the inlet threads, hand tighten the sprinkler into the sprinkler fitting.

Step 3. Wrench tighten the sprinkler by wrenching on the Casing with a pipe wrench whenever the casing is readily accessible. Otherwise, use a W-Type 7 Sprinkler Wrench (Ref. Figure 2). The wrench recess of the W-Type 7 is to be applied to the sprinkler wrench flats (Ref. Figure 2).

Step 4. After the ceiling/wall has been installed/finished, slide on the outer piece of the Escutcheon until it comes in contact with the ceiling/wall. Do not lift the ceiling panel out of its normal position.

In the case of the outer piece of the Deep Escutcheon, hold the outer piece in contact with the mounting surface (ceiling), and then rotate the inner piece approximately 1/4 turn with respect to the outer piece, to hold the Deep Escutcheon firmly together.

Care and Maintenance

The Series DS-1 Dry Type Sprinklers must be maintained and serviced in accordance with the following instructions:

NOTES

Absence of the outer piece of an escutcheon, which is used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection systems must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

A Vent Hole is provided in the Bulb Seat (Ref. Figure 1) to indicate if the Dry Sprinkler is remaining dry. Evidence of leakage from the Vent Hole is an indication that there may be weepage past the Inlet seal and that the sprinkler needs to be removed for determining the cause of leakage (e.g. an improper installation or an ice plug). The fire protection system control valve must be closed and the system drained before removing the sprinkler.

Sprinklers that are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage - before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb (Ref. Installation Section).

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this docu-

ment, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. The installing contractor or sprinkler manufacturer should be contacted relative to any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

Limited Warranty

Products manufactured by Tyco Fire Products are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by Tyco Fire Products. No warranty is given for products or components manufactured by companies not affiliated by ownership with Tyco Fire Products or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by Tyco Fire Products to be defective shall be either repaired or replaced, at Tyco Fire Products' sole option. Tyco Fire Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire Products shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

IN NO EVENT SHALL TYCO FIRE PRODUCTS BE LIABLE, IN CONTRACT, TORT, STRICT LIABILITY OR UNDER ANY OTHER LEGAL THEORY, FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LABOR CHARGES, REGARDLESS OF WHETHER TYCO FIRE PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE PRODUCTS' LIABILITY EXCEED AN AMOUNT EQUAL TO THE SALES PRICE.

THE FOREGOING WARRANTY IS MADE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Ordering Procedure

Contact your local distributor for availability, and please specify the following:

1. Sprinkler.
   - Model/SIN.
   - Quick Response, Standard Coverage, Dry Type Sprinkler
   - Deflector Style.
   - 5.6 K-factor.
   - Order Length.

     Dry Type Sprinklers are furnished based upon Order Length as measured per Figure 3 through 11, as applicable. After the measurement is taken, round it to the nearest 1/4 inch increment.
   - Inlet Connection (1 Inch NPT or ISO 7-R1).
   - Temperature Rating.
   - Sprinkler Finish.
   - Escutcheon Style and Finish, as applicable.
   - Part Number from Table B. (Part numbers are for 1 inch NPT standard order sprinklers. Orders for all other sprinkler assemblies must be accompanied by a complete description.)
2. W-Type 7 Sprinkler Wrench.

Refer to the Price List for complete listing of Part Numbers.

P/N 60 — XXX — X — XXX

	MODEL/SIN
36 **Pendent** w/ Standard Escutcheon (1" NPT)	TY3235 (Fig. 5)
33 **Pendent** w/ Deep Escutcheon (1" NPT)	TY3235 (Fig. 6)
37 **Pendent** w/ Std. Recessed Escutcheon (1" NPT)	TY3235 (Fig. 3)
32 **Pendent** w/o Escutcheon Escutcheon (1" NPT)	TY3235 (Fig. 7)
34 **Sidewall** w/ Standard Escutcheon (1" NPT)	TY3335 (Fig. 9)
43 **Sidewall** w/ Deep Escutcheon (1" NPT)	TY3335 (Fig. 10)
44 **Sidewall** w/o Escutcheon (1" NPT)	TY3335 (Fig. 11)
38 **Upright** w/o Escutcheon (1" NPT)	TY3135 (Fig. 8)

	SPRINKLER FINISH	ESCUTCHEON FINISH (2)
1	NATURAL BRASS	WHITE
4	WHITE POLYESTER	WHITE
9	CHROME PLATED	CHROME PLATED
0	CHROME PLATED	WHITE
3	WHITE (RAL9010)*	WHITE (RAL9010)*

	TEMPERATURE RATING (3)
0	135F/57C
1	155F/68C
2	175F/79C
3	200F/93C
4	286F/141C

	ORDER LENGTH (1) (EXAMPLES)
055	5.50"
082	8.25"
180	18.00"
187	18.75"
372	37.25"
480	48.00"

NOTES

(1). Dry Type Sprinklers are furnished based upon "Order Length" as measured per Figures 3 through 11, as applicable, and for each individual sprinkler where it is to be installed. After the measurement is taken, round it to the nearest 1/4 inch increment.

(2). Escutcheon Finish applies to sprinklers provided with escutcheons.

(3). The 286F/141C temperature rating applies to non-recessed sprinkler assemblies.

* Eastern Hemisphere sales only.

TABLE B
PART NUMBER SELECTION
SERIES DS-1, QUICK RESPONSE, STANDARD COVERAGE, DRY TYPE SPRINKLERS
(Use Prefix "I" for ISO 7-R1 Connection, e.g., I-60-361-1-180)

tyco / Fire & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500

Series TY-FRB — 5.6 K-factor Horizontal and Vertical Sidewall Sprinklers Quick Response, Standard Coverage

General Description

The Series TY-FRB, 5.6 K-Factor, Horizontal and Vertical Sidewall Sprinklers described in this data sheet are quick response - standard coverage, decorative 3 mm glass bulb type spray sprinklers designed for use in light and ordinary hazard, commercial occupancies such as banks, hotels, shopping malls, etc. They are designed for installation along a wall or the side of a beam and just beneath a smooth ceiling. Sidewall sprinklers are commonly used instead of pendent or upright sprinklers due to aesthetics or building construction considerations, where piping across the ceiling is not desirable.

The recessed version of the Series TY-FRB Horizontal Sidewall Sprinkler is intended for use in areas with a finished wall. It uses a two-piece Style 10 Recessed Escutcheon with 1/2 inch (12,7 mm) of recessed adjustment or up to 3/4 inch (19,1 mm) of total adjustment from the flush sidewall position, or a two-piece Style 20 Recessed Escutcheon with 1/4 inch (6,4 mm) of recessed adjustment or up to 1/2 inch (12,7 mm) of total adjustment from the flush sidewall position. The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe nipples to the sprinklers must be cut.

Corrosion resistant coatings, where applicable, are utilized to extend the life of copper alloy sprinklers beyond that which would otherwise be obtained when exposed to corrosive atmospheres. Although corrosion resistant coated sprinklers have passed the standard corrosion tests of the applicable approval agencies, the testing is not representative of all possible corrosive atmospheres. Consequently, it is recommended that the end user be consulted with respect to the suitability of these coatings for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity, should be considered, as a minimum, along with the corrosive nature of the chemical to which the sprinklers will be exposed.

WARNINGS

The Series TY-FRB Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. ***Failure to do so may impair the performance of these devices.***

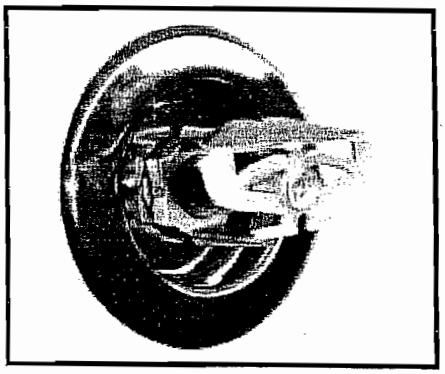
The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.

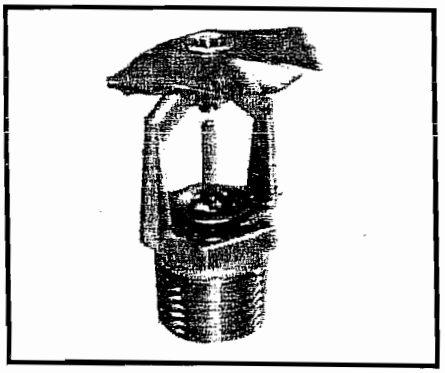
IMPORTANT

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

Model/Sprinkler Identification Numbers

TY3331 - Horizontal
TY3431 - Vertical





Technical Data

Approvals
UL and C-UL Listed.
FM, LPCB, and NYC Approved.
(Refer to Table A for complete approval information including corrosion resistant status.)

Maximum Working Pressure
Refer to Table B.

Discharge Coefficient
K = 5.6 GPM/psi$^{1/2}$ (80,6 LPM/bar$^{1/2}$)

Temperature Ratings
Refer to Table A.

Finishes
Sprinkler: Refer to Table A.
Recessed Escutcheon: White Coated, Chrome Plated, or Brass Plated.

K	TYPE	TEMP.	BULB LIQUID	SPRINKLER FINISH (See Note 11)			
				NATURAL BRASS	CHROME PLATED	WHITE*** POLYESTER	LEAD COATED
5.6 1/2" NPT	HORIZ. SIDEWALL (TY3331)	135°F/57°C	Orange	1, 2, 3, 4, 9, 10		1, 2, 3, 9	1, 2, 3, 9
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				
	RECESSED HORIZ. SIDEWALL (TY3331)* Figure 3	135°F/57°C	Orange	1, 2, 4, 9, 10		1, 2, 9	N/A
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
	RECESSED HORIZ. SIDEWALL (TY3331)** Figure 4	135°F/57°C	Orange	1, 2, 3, 4, 9			N/A
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
5.6 1/2" NPT	VERTICAL SIDEWALL (TY3431) Installed Pendent or Upright	135°F/57°C	Orange	5, 6, 7, 8, 9			5, 6, 7, 9
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				

NOTES:

1. Listed by Underwriters Laboratories, Inc. (UL) as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies at a 4 to 12 inch (100 to 300 mm) top of deflector to ceiling distance.
2. Listed by Underwriters Laboratories Inc. for use in Canada (C-UL) as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies at a 4 to 12 inch (100 to 300 mm) top of deflector to ceiling distance.
3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers for use in Light Hazard Occupancies at a 4 to 12 inch (100 to 300 mm) top of deflector to ceiling distance.
4. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 007a/04) at a 4 to 6 inch (100 to 150 mm) top of deflector to ceiling distance. The LPC does not rate the thermal sensitivity of horizontal sidewall sprinklers.
5. Listed by Underwriters Laboratories, Inc. as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies.
6. Listed by Underwriters Laboratories for use in Canada (C-UL) as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies.
7. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers for use in Light Hazard Occupancies.
8. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06 & 007a/04) as Quick Response Sprinklers.
9. Approved by the City of New York under MEA 354-01-E.
10. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06) at a 4 to 6 inch (100 to 150 mm) top of deflector to ceiling distance. The LPC does not rate the thermal sensitivity of horizontal sidewall sprinklers.
11. Where Polyester Coated and Lead Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion Resistant Sprinklers. Where Lead Coated Sprinklers are noted to be FM Approved, the sprinklers are FM Approved as Corrosion Resistant Sprinklers.

* Installed with Style 10 (1/2" NPT) 3/4" Total Adjustment Recessed Escutcheon.
** Installed with Style 20 (1/2" NPT) 1/2" Total Adjustment Recessed Escutcheon.
*** Frame and deflector only. Listings and approvals apply to color (Special Order).

TABLE A
LABORATORY LISTINGS AND APPROVALS

Physical Characteristics

Frame . . . . . Bronze
Button . . . . . Brass/Copper
Sealing Assembly . . . . . Beryllium Nickel w/Teflon†
Bulb . . . . . Glass
Compression Screw . . . . . Bronze
HSW Deflector . . . . . Bronze
VSW Deflector . . . . . Copper

Patents

U.S.A. 5,810,263

Operation

The glass Bulb contains a fluid which expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass Bulb, allowing the sprinkler to activate and water to flow.

† DuPont Registered Trademark

K	TYPE	SPRINKLER FINISH			
		NATURAL BRASS	CHROME PLATED	WHITE POLYESTER	LEAD COATED
5.6 1/2" NPT	HORIZONTAL SIDEWALL (TY3331)	250 PSI (17,2 BAR) OR 175 PSI (12,1 BAR) (SEE NOTE 1)			175 PSI (12,1 BAR)
	RECESSED HORIZ. SIDEWALL (TY3331)				N/A
	VERTICAL SIDEWALL (TY3431)	175 PSI (12,1 BAR)			

NOTES:
1. The maximum working pressure of 250 psi (17,2 bar) only applies to the Listing by Underwriters Laboratories, Inc. (UL); the Listing by Underwriters Laboratories, Inc. for use in Canada (C-UL); and, the Approval by the City of New York.

TABLE B, MAXIMUM WORKING PRESSURE

Design Criteria

The Series TY-FRB Horizontal and Vertical Sidewall Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (e.g., UL Listing is based on the requirements of NFPA 13, and FM Approval is based on the requirements of FM's Loss Prevention Data Sheets). Only the Style 10 or 20 Recessed Escutcheon, as applicable, is to be used for recessed horizontal installations.

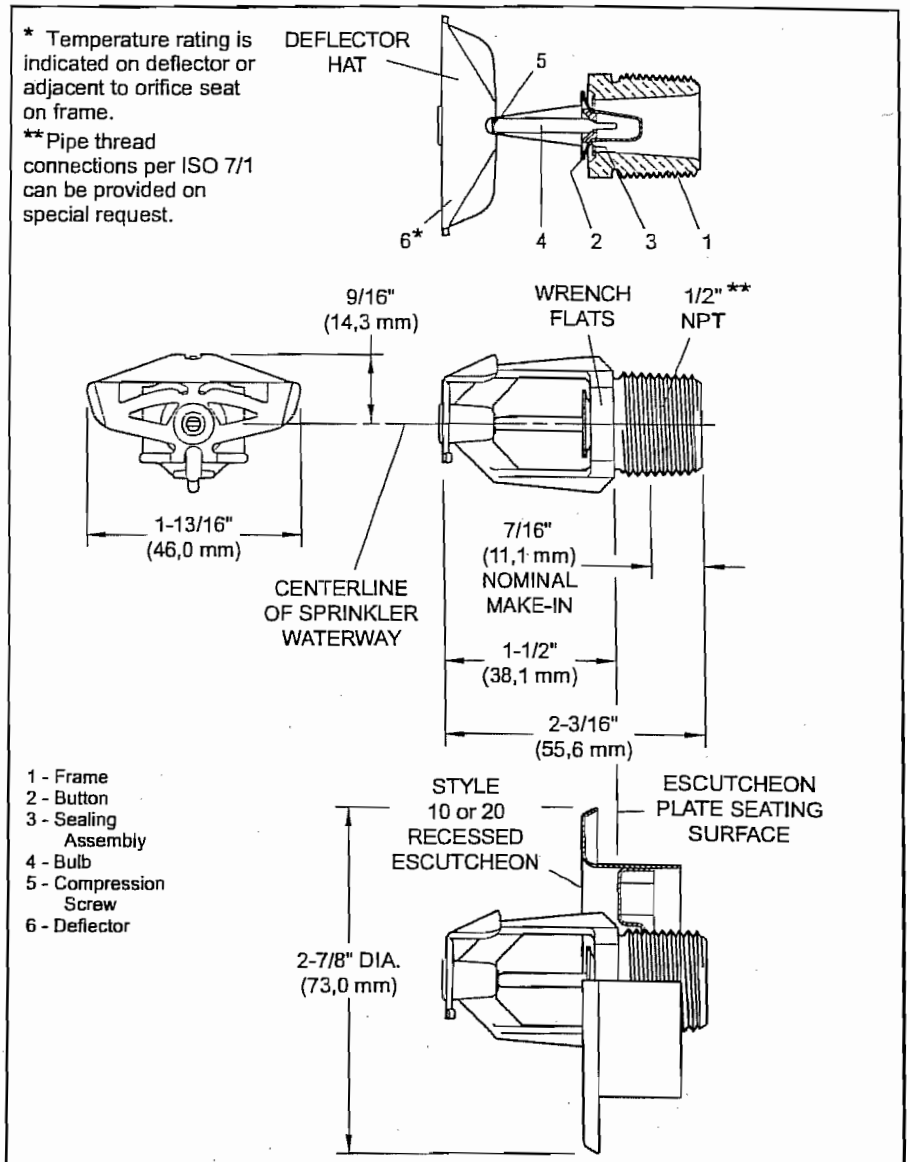


FIGURE 1
5.6 K-FACTOR QUICK RESPONSE
SERIES TY-FRB HORIZONTAL SIDEWALL (TY3331) SPRINKLERS

Installation

The Series TY-FRB Sprinklers must be installed in accordance with the following instructions:

NOTES

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm) for the 135°F/57°C to 3/32 inch (2,4 mm) for the 286°F/141°C temperature ratings.

A leak tight 1/2 inch NPT sprinkler joint should be obtained with a torque of 7 to 14 ft.lbs. (9,5 to 19,0 Nm). A maximum of 21 ft. lbs. (28,5 Nm) of torque may be used to install sprinklers with 1/2 NPT connections. Higher levels of torque may distort the sprinkler and cause leakage or impairment of the sprinkler.

Do not attempt to make-up for insufficient adjustment in the escutcheon plate by under- or over-tightening the sprinkler. Readjust the position of the sprinkler fitting to suit.

The **Series TY-FRB Horizontal and Vertical Sidewall Sprinklers** must be installed in accordance with the following instructions.

Step 1. Horizontal sidewall sprinklers are to be installed in the horizontal position with their centerline of waterway perpendicular to the back wall and parallel to the ceiling. The word "TOP" on the Deflector is to face towards the ceiling.

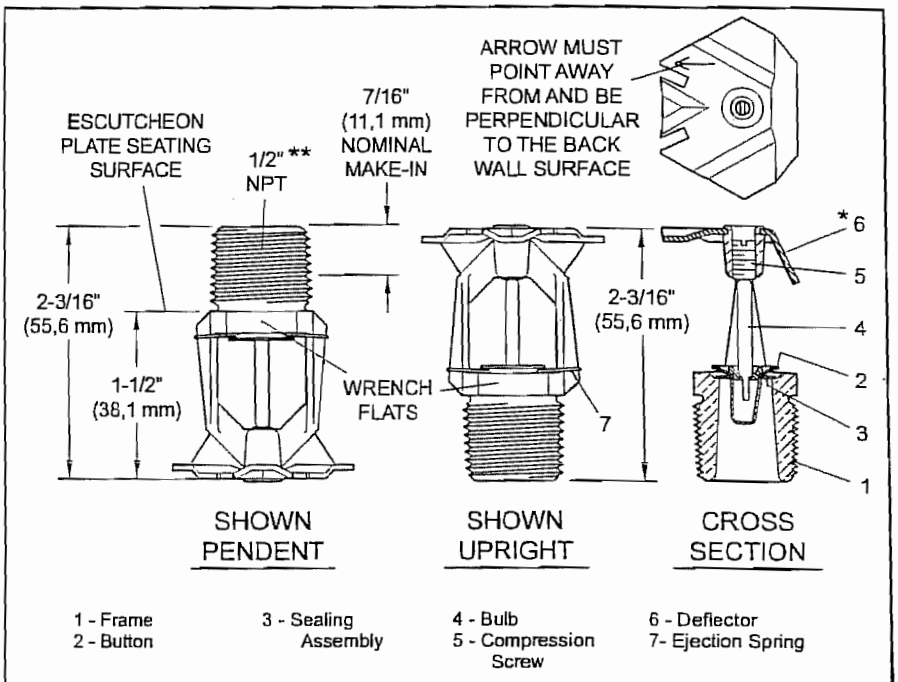
Vertical sidewall sprinklers are to be installed in the pendent or upright position with the arrow on the Deflector pointing away from the wall.

Step 2. With pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Ref. Figure 5), With reference to Figure 1 or 2, the W-Type 6 Sprinkler Wrench is to be applied to the wrench flats.

The **Series TY-FRB Recessed Horizontal Sidewall Sprinklers** must be installed in accordance with the following instructions.

Step A. Recessed horizontal sidewall sprinklers are to be installed in the horizontal position with their centerline of waterway perpendicular to the back wall and parallel to the ceiling. The word "TOP" on the Deflector is to face towards the ceiling.



* Temperature rating is indicated on deflector or adjacent to orifice seat on frame.

** Pipe thread connections per ISO 7/1 can be provided on special request.

FIGURE 2
5.6 K-FACTOR QUICK RESPONSE
SERIES TY-FRB VERTICAL SIDEWALL (TY3431) SPRINKLERS

Step B. After installing the Style 10 or 20 Mounting Plate over the sprinkler threads, hand tighten the sprinkler into the sprinkler fitting.

Step C. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Ref. Figure 6). With reference to Figure 1, the W-Type 7 Recessed Sprinkler Wrench is to be applied to the sprinkler wrench flats.

Step D. After the ceiling has been installed or the finish coat has been applied, slide on the Style 10 or 20 Closure over the Series TY-FRB Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling

Care and Maintenance

The Series TY-BFR Sprinklers must be maintained and serviced in accordance with the following instructions:

NOTES

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection system must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

The owner must assure that the sprinklers are not used for hanging of any objects; otherwise, non-operation in the event of a fire or inadvertent operation may result.

Absence of an escutcheon, which is used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.

Sprinklers that are found to be leaking or exhibiting visible signs of corrosion

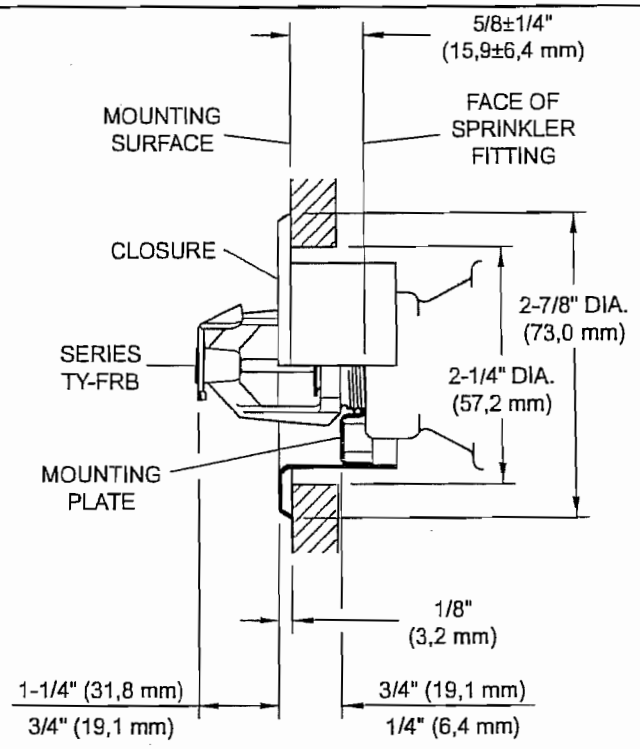


FIGURE 3
SERIES TY-FRB RECESSED HORIZONTAL SIDEWALL SPRINKLER WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT STYLE 10 RECESSED ESCUTCHEON

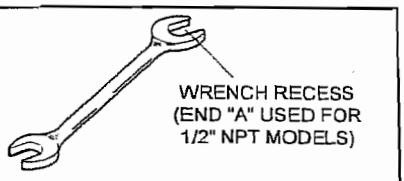


FIGURE 5
W-TYPE 6 SPRINKLER WRENCH

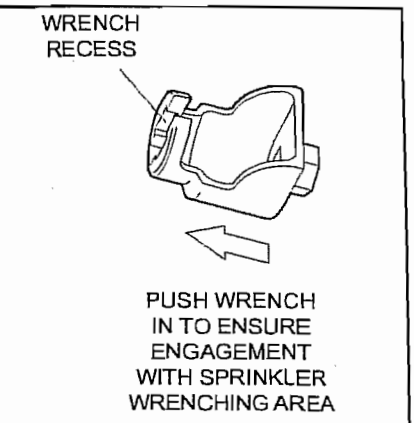


FIGURE 6
W-TYPE 7 RECESSED SPRINKLER WRENCH

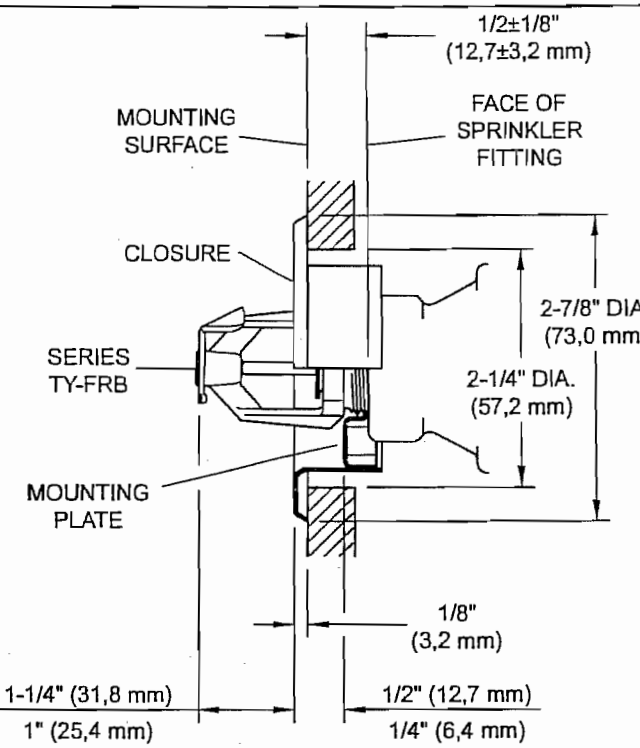


FIGURE 4
SERIES TY-FRB RECESSED HORIZONTAL SIDEWALL SPRINKLER WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT STYLE 20 RECESSED ESCUTCHEON

must be replaced.

Automatic sprinklers must never be painted, plated, coated or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers - before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section).

Frequent visual inspections are recommended to be initially performed for corrosion resistant coated sprinklers, after the installation has been completed, to verify the integrity of the corrosion resistant coating. Thereafter, annual inspections per NFPA 25 should suffice; however, instead of inspecting from the floor level, a random sampling of close-up visual inspections should be made, so as to better determine the exact sprinkler condition and the long term integrity of the

P/N 57 — XXX — X — XXX

	MODEL/SIN
378 HORIZONTAL SIDEWALL	TY3331
375 VERTICAL SIDEWALL	TY3431

	SPRINKLER
1	NATURAL BRASS
4	WHITE POLYESTER
3	WHITE RAL9010)*
9	CHROME PLATED
7	LEAD COATED

	TEMPERATURE RATING
135	135°F/57°C
155	155°F/68°C
175	175°F/79°C
200	200°F/93°C
286	286°F/141°C

* Eastern Hemisphere sales only.

TABLE C
PART NUMBER SELECTION
SERIES TY-FRB HORIZONTAL AND VERTICAL SIDEWALL SPRINKLERS

corrosion resistant coating, as it may be affected by the corrosive conditions present.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. The installing contractor or sprinkler manufacturer should be contacted relative to any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

Limited Warranty

Products manufactured by Tyco Fire & Building Products (TFBP) are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by TFBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by TFBP to be defective shall be either repaired or replaced, at TFBP's sole option. TFBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

in no event shall TFBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFBP was informed about the possibility of such damages, and in no event shall TFBP's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

Ordering Procedure

When placing an order, indicate the full product name. Refer to the Price List for complete listing of Part Numbers.

Contact your local distributor for availability.

Sprinkler Assemblies with NPT Thread Connections:
Specify: (Specify Model/SIN), Quick Response, (specify K-factor), (specify temperature rating), Series TY-FRB (specify Horizontal Sidewall or Vertical Sidewall) Sprinkler with (specify type of finish or coating), P/N (specify from Table C).

Recessed Escutcheon:
Specify: Style (10 or 20) Recessed Escutcheon with (specify*) finish, P/N (specify*).

* Refer to Technical Data Sheet TFP770.

Sprinkler Wrench:
Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387.

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001.

tyco / Fire & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500

Series TY-FRB — 2.8, 4.2, 5.6, and 8.0 K-factor Upright, Pendent, and Recessed Pendent Sprinklers Quick Response, Standard Coverage

General Description

The Tyco® Series TY-FRB, 2.8, 4.2, 5.6, and 8.0 K-factor, Upright and Pendent Sprinklers described in this data sheet are quick response - standard coverage, decorative 3 mm glass bulb type spray sprinklers designed for use in light or ordinary hazard, commercial occupancies such as banks, hotels, shopping malls, etc.

The recessed version of the Series TY-FRB Pendent Sprinkler, where applicable, is intended for use in areas with a finished ceiling. It uses either a two-piece Style 10 (1/2 inch NPT) or Style 40 (3/4 inch NPT) Recessed Escutcheon with 1/2 inch (12,7 mm) of recessed adjustment or up to 3/4 inch (19,1 mm) of total adjustment from the flush pendent position, or a two-piece Style 20 (1/2 inch NPT) or Style 30 (3/4 inch NPT) Recessed Escutcheon with 1/4 inch (6,4 mm) of recessed adjustment or up to 1/2 inch (12,7 mm) of total adjustment from the flush pendent position. The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe drops to the sprinklers must be cut.

Corrosion resistant coatings, where applicable, are utilized to extend the life of copper alloy sprinklers beyond that which would otherwise be obtained when exposed to corrosive atmospheres. Although corrosion resistant coated sprinklers have passed the standard corrosion tests of the applicable approval agencies, the testing is not representative of all possible corrosive atmospheres. Consequently, it is recommended that the end user be consulted with respect to the suitability of these coatings for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity, should be considered, as a minimum, along with the corrosive nature of the chemical to which the sprinklers will be exposed.

An intermediate level versions of the Series TY-FRB Pendent Sprinklers are detailed in Technical Data Sheet TFP356, and Sprinkler Guards are detailed in Technical Data Sheet TFP780

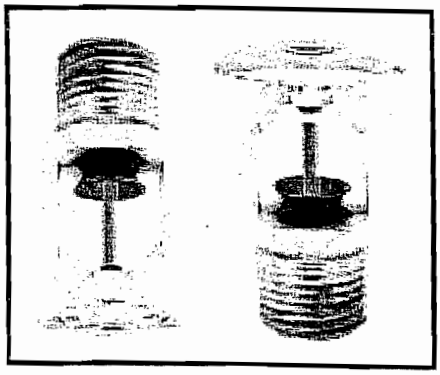
IMPORTANT

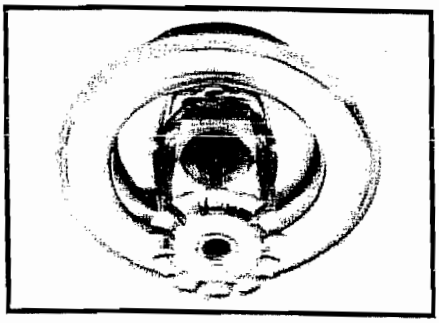
Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

WARNINGS

The Series TY-FRB Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. ***Failure to do so may impair the performance of these devices.***

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.





Model/Sprinkler Identification Numbers

TY1131 -	Upright 2.8K, 1/2"NPT
TY1231 -	Pendent 2.8K, 1/2"NPT
TY2131 -	Upright 4.2K, 1/2"NPT
TY2231 -	Pendent 4.2K, 1/2"NPT
TY3131 -	Upright 5.6K, 1/2"NPT
TY3231 -	Pendent 5.6K, 1/2"NPT
TY4131 -	Upright 8.0K, 3/4"NPT
TY4231 -	Pendent 8.0K, 3/4"NPT
TY4831-	Upright 8.0K, 1/2"NPT
TY4931-	Pendent 8.0K, 1/2"NPT

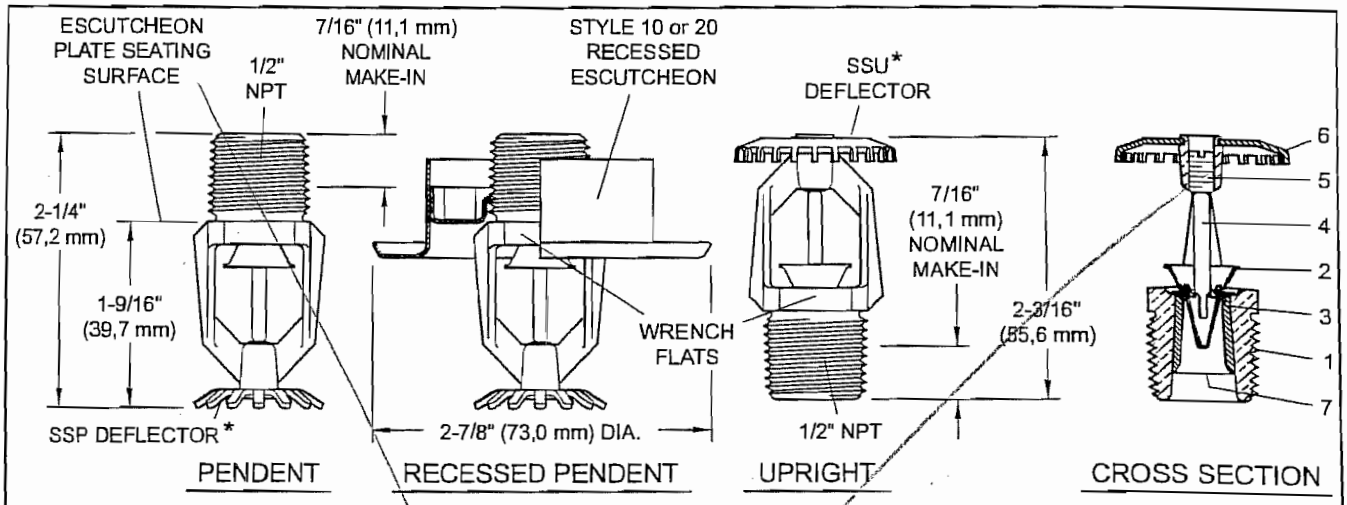


FIGURE 1
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY1131) AND PENDENT (TY1231) SPRINKLERS
2.8 K-FACTOR, 1/2 INCH NPT

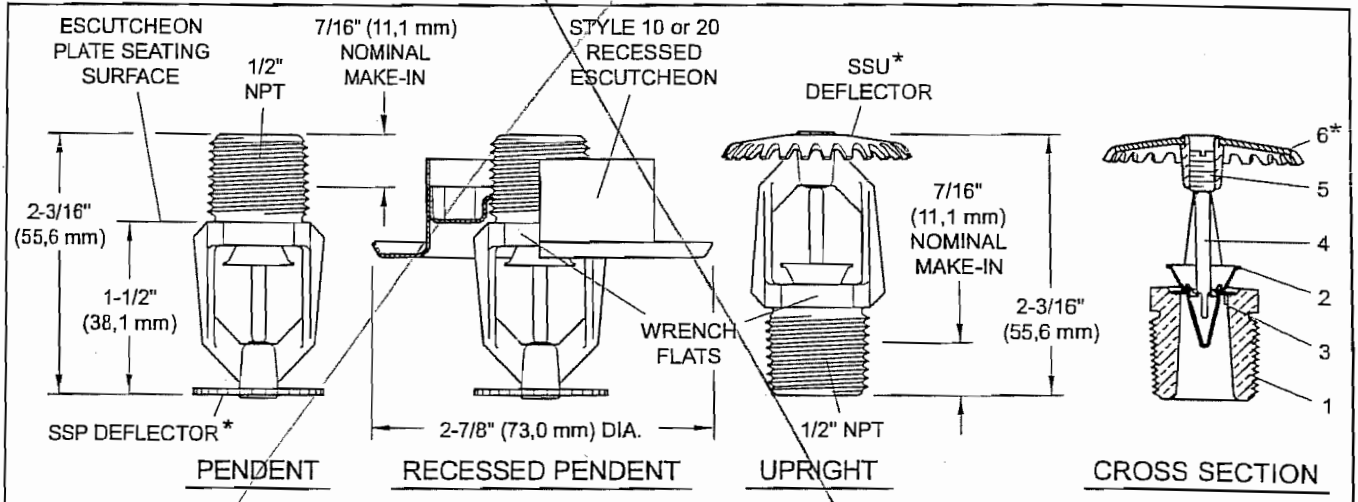


FIGURE 2
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY2131) AND PENDENT (TY2231) SPRINKLERS
4.2 K-FACTOR, 1/2 INCH NPT

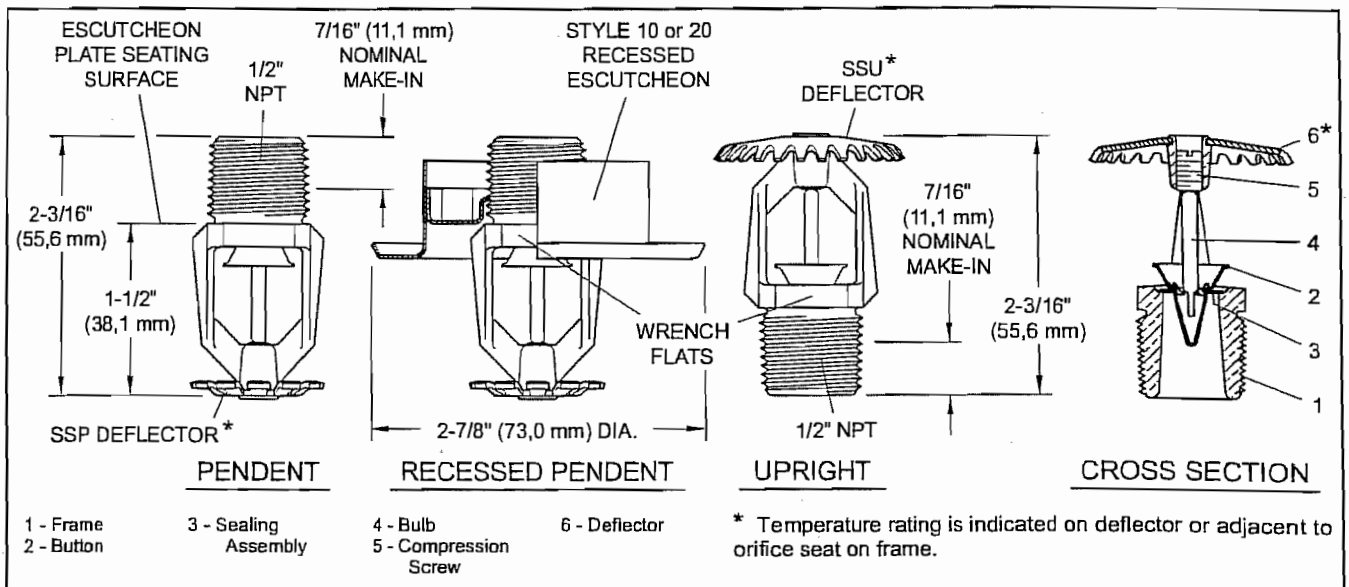


FIGURE 3
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY3131) AND PENDENT (TY3231) SPRINKLERS
5.6 K-FACTOR, 1/2 INCH NPT

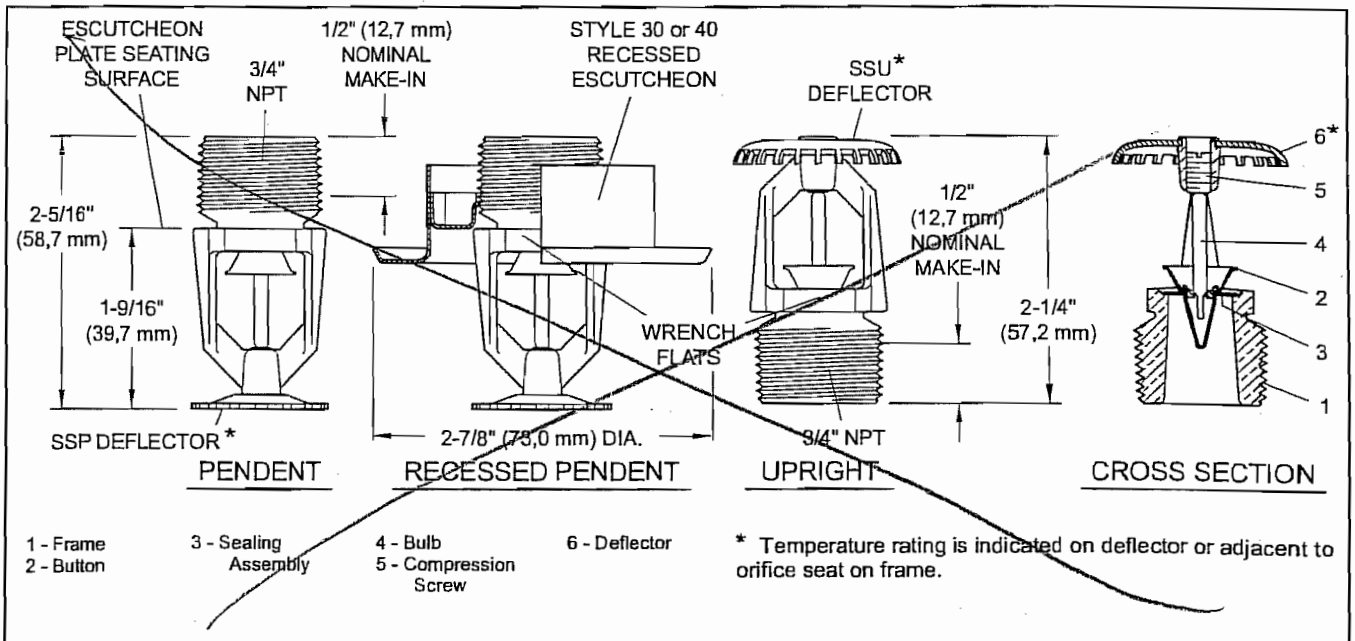


FIGURE 4
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY4131) AND PENDENT (TY4231) SPRINKLERS
8.0 K-FACTOR, 3/4 INCH NPT

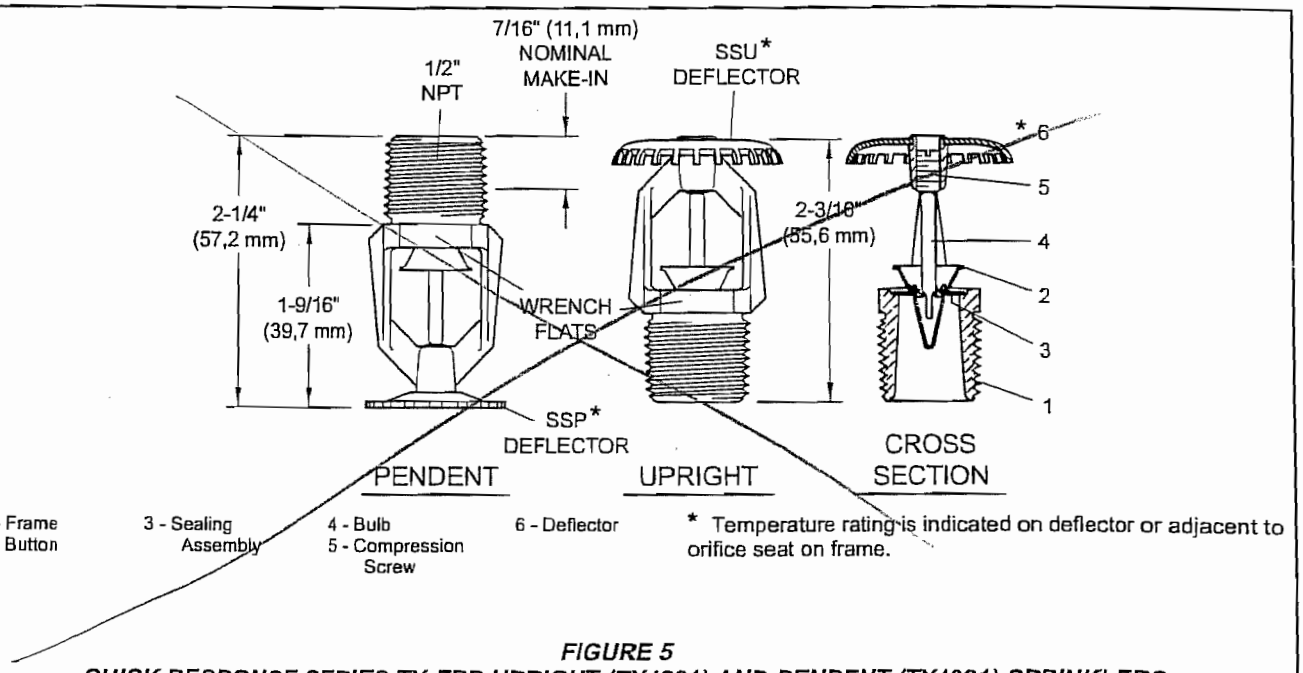


FIGURE 5
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY4831) AND PENDENT (TY4931) SPRINKLERS
8.0 K-FACTOR, 1/2 INCH NPT

Technical Data

Approvals
UL and C-UL Listed.
FM, LPCB, and NYC Approved.
(Refer to Table A and B for complete approval information including corrosion resistant status.)

Maximum Working Pressure
Refer to Table C.

Discharge Coefficient
K = 2.8 GPM/psi$^{1/2}$ (40,3 LPM/bar$^{1/2}$)
K = 4.2 GPM/psi$^{1/2}$ (60,5 LPM/bar$^{1/2}$)
K = 5.6 GPM/psi$^{1/2}$ (80,6 LPM/bar$^{1/2}$)
K = 8.0 GPM/psi$^{1/2}$ (115,2 LPM/bar$^{1/2}$)

Temperature Ratings
Refer to Table A and B

Finishes
Sprinkler: Refer to Table A and B.
Recessed Escutcheon: White Coated, Chrome Plated, or Brass Plated.

Physical Characteristics

Frame	Bronze
Button	Brass/Copper
Sealing Assembly	Beryllium Nickel w/Teflon†
Bulb	Glass
Compression Screw	Bronze
Deflector	Copper/Bronze
Bushing (K=2.8)	Bronze

Operation

The glass Bulb contains a fluid which expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass Bulb, allowing the sprinkler to activate and water to flow.

Design Criteria

The Series TY-FRB Pendent and Upright Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (e.g., UL Listing is based on the requirements of NFPA 13, and FM Approval is based on the requirements of FM's Loss Prevention Data Sheets). Only the Style 10, 20, 30, or 40 Recessed Escutcheon, as applicable, is to be used for recessed pendent installations.

† DuPont Registered Trademark

K	TYPE	TEMP.	BULB LIQUID	SPRINKLER FINISH (See Note 7) NATURAL BRASS	CHROME PLATED	WHITE*** POLYESTER
2.8 1/2" NPT	PENDENT (TY1231) and UPRIGHT (TY1131)	135°F/57°C	Orange	1, 2, 3, 5		
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
		286°F/141°C	Blue			
	RECESSED PENDENT (TY1231)* Figure 6	135°F/57°C	Orange	1, 2, 5		
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
	RECESSED PENDENT (TY1231)** Figure 7	135°F/57°C	Orange			
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
4.2 1/2" NPT	PENDENT (TY2231) and UPRIGHT (TY2131)	135°F/57°C	Orange	1, 2		
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
		286°F/141°C	Blue			
	RECESSED PENDENT (TY2231)* Figure 8	135°F/57°C	Orange			
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
	RECESSED PENDENT (TY2231)** Figure 9	135°F/57°C	Orange			
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			

NOTES:

1. Listed by Underwriters Laboratories, Inc. (UL) as Quick Response Sprinklers.
2. Listed by Underwriters Laboratories, Inc. for use in Canada (C-UL) as Quick Response Sprinklers.
3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers.
5. Approved by the City of New York under MEA 354-01-E.
7. Where Polyester Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion Resistant Sprinklers.

* Installed with Style 10 (1/2" NPT) or Style 40 (3/4" NPT) 3/4" Total Adjustment Recessed Escutcheon, as applicable.

** Installed with Style 20 (1/2" NPT) or Style 30 (3/4" NPT) 1/2" Total Adjustment Recessed Escutcheon, as applicable.

*** Frame and Deflector only. Listings and approvals apply to color (Special Order).

N/A: Not Available

TABLE A
LABORATORY LISTINGS AND APPROVALS
2.8 AND 4.2 K-FACTOR SPRINKLERS

K	TYPE	TEMP.	BULB LIQUID	SPRINKLER FINISH (See Note 8)			
				NATURAL BRASS	CHROME PLATED	WHITE*** POLYESTER	LEAD COATED
5.6 1/2" NPT	PENDENT (TY3231) and UPRIGHT (TY3131)	135°F/57°C	Orange	1, 2, 3, 4, 5, 6, 7			1, 2, 3, 5
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				
	RECESSED PENDENT (TY3231)* Figure 10	135°F/57°C	Orange	1, 2, 4, 5			N/A
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
	RECESSED PENDENT (TY3231)** Figure 11	135°F/57°C	Orange	1, 2, 3, 4, 5			N/A
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
8.0 3/4" NPT	PENDENT (TY4231) and UPRIGHT (TY4131)	135°F/57°C	Orange	1, 2, 3, 4, 5, 6, 7			1, 2, 5
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				
	RECESSED PENDENT (TY4231)* Figure 12	135°F/57°C	Green	1, 2, 4, 5			N/A
		155°F/68°C	Orange				
		175°F/79°C	Red				
		200°F/93°C	Yellow				
	RECESSED PENDENT (TY4231)** Figure 13	135°F/57°C	Orange	1, 2, 3, 4, 5			N/A
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
8.0 1/2" NPT	PENDENT (TY4931) and UPRIGHT (TY4831)	135°F/57°C	Orange	1, 2, 4, 5, 6			1, 2, 5
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				

NOTES:

1. Listed by Underwriters Laboratories, Inc. (UL) as Quick Response Sprinklers.
2. Listed by Underwriters Laboratories, Inc. for use in Canada (C-UL) as Quick Response Sprinklers.
3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers.
4. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 007k/04) as Quick Response Sprinklers; however, the LPCB does not rate the thermal sensitivity of recessed sprinklers.
5. Approved by the City of New York under MEA 354-01-E.
6. VdS Approved (For details contact Tyco Fire & Building Products, Enschede, Netherlands, Tel. 31-53-428-4444/Fax 31-53-428-3377).
7. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06) as Quick Response Sprinklers.
8. Where Polyester Coated and Lead Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion Resistant Sprinklers. Where Lead Coated Sprinklers are noted to be FM Approved, the sprinklers are FM Approved as a Corrosion Resistant Sprinklers.

* Installed with Style 10 (1/2" NPT) or Style 40 (3/4" NPT) 3/4" Total Adjustment Recessed Escutcheon, as applicable.
** Installed with Style 20 (1/2" NPT) or Style 30 (3/4" NPT) 1/2" Total Adjustment Recessed Escutcheon, as applicable.
*** Frame and Deflector only. Listings and approvals apply to color (Special Order).
N/A: Not Available

TABLE B
LABORATORY LISTINGS AND APPROVALS
5.6 AND 8.0 K-FACTOR SPRINKLERS

K	TYPE	SPRINKLER FINISH			
		NATURAL BRASS	CHROME PLATED	WHITE POLYESTER	LEAD COATED
2.8 1/2" NPT	PENDENT (TY3231) and UPRIGHT (TY3131)	175 PSI (12,1 BAR)			N/A
	RECESSED PENDENT (TY323)				
4.2 3/4" NPT	PENDENT (TY4231) and UPRIGHT (TY4131)	175 PSI (12,1 BAR)			N/A
	RECESSED PENDENT (TY4231)				
5.6 1/2" NPT	PENDENT (TY3231) and UPRIGHT (TY3131)	250 PSI (17,2 BAR) OR 175 PSI (12,1 BAR) (SEE NOTE 1)			175 PSI (12,1 BAR)
	RECESSED PENDENT (TY3231)				N/A
8.0 3/4" NPT	PENDENT (TY4231) and UPRIGHT (TY4131)	175 PSI (12,1 BAR)			175 PSI (12,1 BAR)
	RECESSED PENDENT (TY4231)				N/A
8.0 1/2" NPT	PENDENT (TY4931) and UPRIGHT (TY4831)	175 PSI (12,1 BAR)			175 PSI (12,1 BAR)

NOTES:
1. The maximum working pressure of 250 psi (17,2 bar) only applies to the Listing by Underwriters Laboratories Inc. (UL); the Listing by Underwriters Laboratories, Inc. for use in Canada (C-UL); and , the Approval by the City of New York.

TABLE C, MAXIMUM WORKING PRESSURE

Installation

The Series TY-FRB Sprinklers must be installed in accordance with the following instructions:

NOTES

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm) for the 135°F/57°C to 3/32 inch (2,4 mm) for the 286°F/141°C temperature ratings.

A leak tight 1/2 inch NPT sprinkler joint should be obtained with a torque of 7 to 14 ft.lbs. (9,5 to 19,0 Nm). A maximum of 21 ft. lbs. (28,5 Nm) of torque may be used to install sprinklers with 1/2 NPT connections. A leak tight 3/4 inch NPT sprinkler joint should be obtained with a torque of 10 to 20 ft.lbs. (13,4 to 26,8 Nm). A maximum of 30 ft.lbs. (40,7 Nm) of torque is to be used to install sprinklers with 3/4 NPT connections. Higher levels of torque may distort the sprinkler inlet and cause leakage or impairment of the sprinkler.

Do not attempt to make-up for insufficient adjustment in the escutcheon plate by under- or over-tightening the sprinkler. Readjust the position of the sprinkler fitting to suit.

The **Series TY-FRB Pendent and Upright Sprinklers** must be installed in accordance with the following instructions.

Step 1. Pendent sprinklers are to be installed in the pendent position, and upright sprinklers are to be installed in the upright position.

Step 2. With pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Ref. Figure 14). With reference to Figures 1, 2, 3, 4, and 5, the W-Type 6 Sprinkler Wrench is to be applied to the sprinkler wrench flats.

The **Series TY-FRB Recessed Pendent Sprinklers** must be installed in accordance with the following instructions.

Step A. After installing the Style 10. 20, 30, or 40 Mounting Plate, as applicable, over the sprinkler threads and with pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

Step B. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Ref. Figure 15). With reference to Figure 1, 2, 3, and 4, the W-Type 7 Recessed

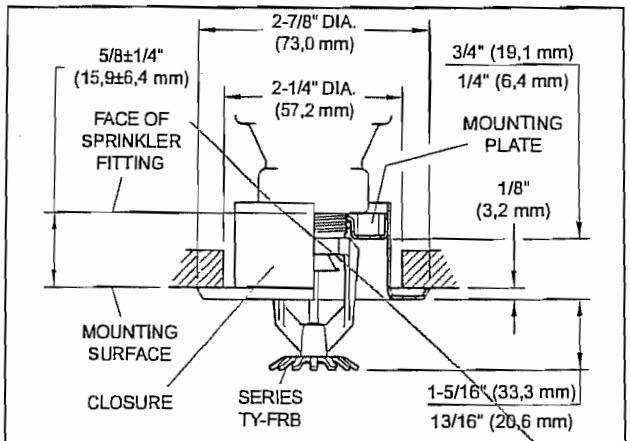


FIGURE 6
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 10 RECESSED ESCUTCHEON
2.8 K-FACTOR, 1/2 INCH NPT

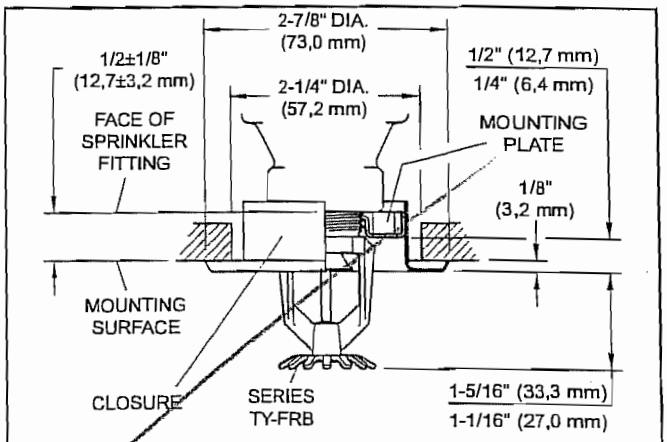


FIGURE 7
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 20 RECESSED ESCUTCHEON
2.8 K-FACTOR, 1/2 INCH NPT

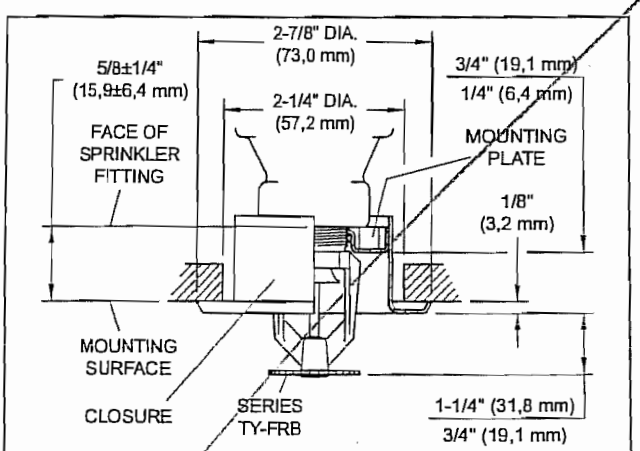


FIGURE 8
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 10 RECESSED ESCUTCHEON
4.2 K-FACTOR, 1/2 INCH NPT

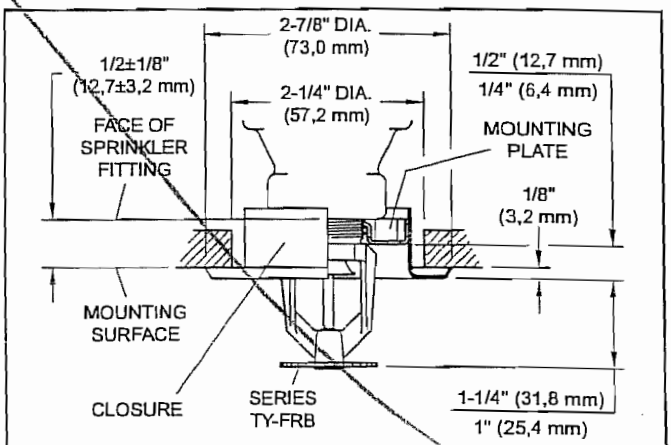


FIGURE 9
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 20 RECESSED ESCUTCHEON
4.2 K-FACTOR, 1/2 INCH NPT

Sprinkler Wrench is to be applied to the sprinkler wrench flats.

Step C. After the ceiling has been installed or the finish coat has been applied, slide on the Style 10, 20, 30, or 40 Closure over the Series TY-FRB Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.

Care and Maintenance

The Series TY-FRB Sprinklers must be maintained and serviced in accordance with the following instructions:

NOTES

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection system must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

The owner must assure that the sprinklers are not used for hanging of any objects; otherwise, non-operation in the event of a fire or inadvertent operation may result.

Absence of an escutcheon, which is used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.

Sprinklers that are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers - before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section).

Frequent visual inspections are recommended to be initially performed for corrosion resistant coated sprinklers, after the installation has been com-

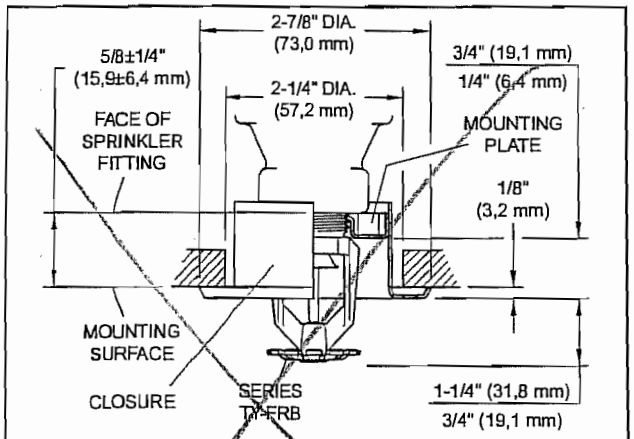


FIGURE 10
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 10 RECESSED ESCUTCHEON
5.6 K-FACTOR, 1/2 INCH NPT

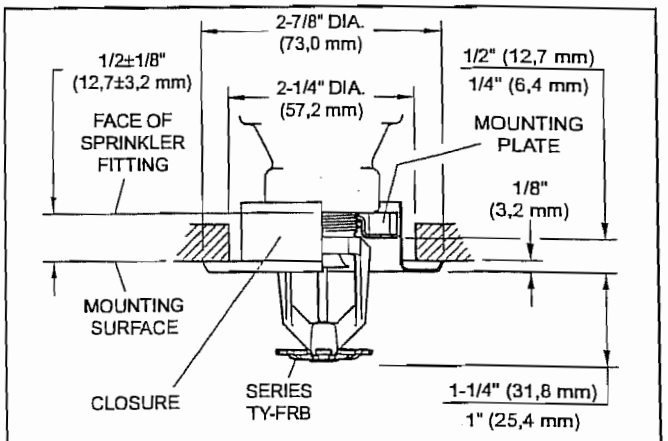


FIGURE 11
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 20 RECESSED ESCUTCHEON
5.6 K-FACTOR, 1/2 INCH NPT

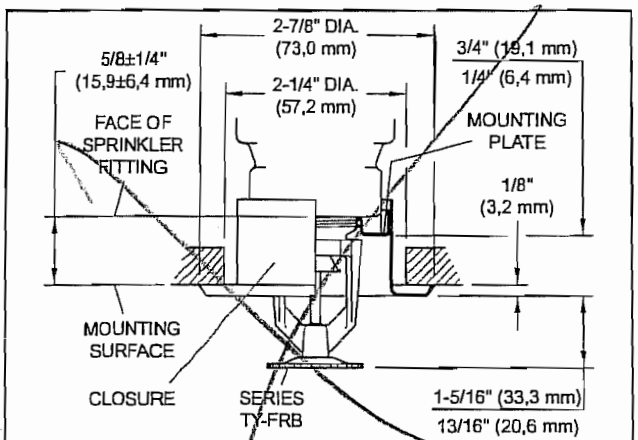


FIGURE 12
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 40 RECESSED ESCUTCHEON
8.0 K-FACTOR, 3/4 INCH NPT

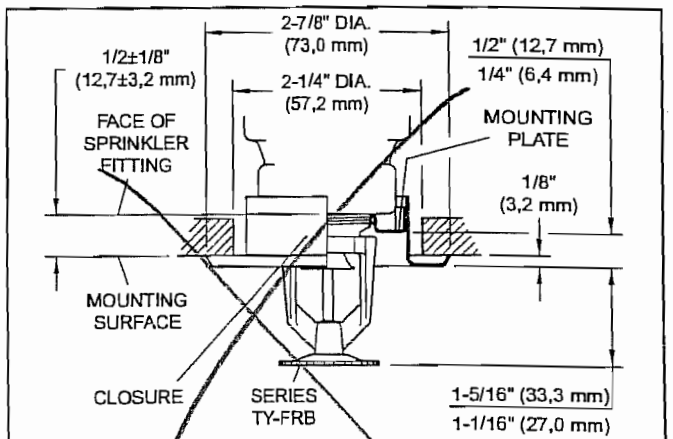


FIGURE 13
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 30 RECESSED ESCUTCHEON
8.0 K-FACTOR, 3/4 INCH NPT

pleted, to verify the integrity of the corrosion resistant coating. Thereafter, annual inspections per NFPA 25 should suffice; however, instead of inspecting from the floor level, a random sampling of close-up visual inspections should be made, so as to better determine the exact sprinkler condition and the long term integrity of the corrosion resistant coating, as it may be affected by the corrosive conditions present.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. The installing contractor or sprinkler manufacturer should be contacted relative to any questions.

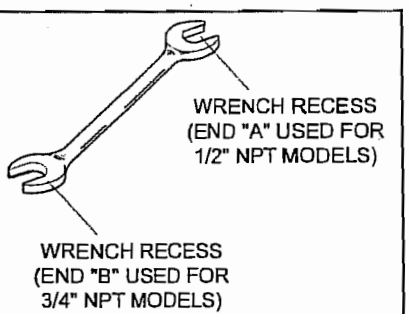


FIGURE 14
W-TYPE 6 SPRINKLER
WRENCH

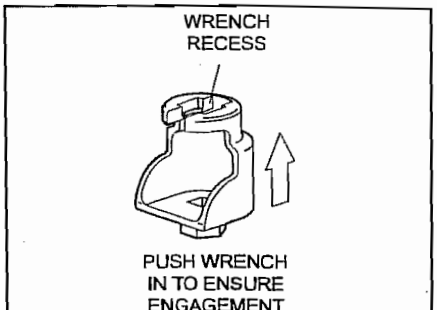


FIGURE 15
W-TYPE 7 RECESSED
SPRINKLER WRENCH

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

P/N 57 — XXX — X — XXX

		MODEL/SIN
330	2.8K UPRIGHT (1/2"NPT)	TY1131
331	2.8K PENDENT (1/2"NPT)	TY1231
340	4.2K UPRIGHT (1/2"NPT)	TY2131
341	4.2K PENDENT (1/2"NPT)	TY2231
370	5.6K UPRIGHT (1/2"NPT)	TY3131
371	5.6K PENDENT (1/2"NPT)	TY3231
390	8.0K UPRIGHT (3/4"NPT)	TY4131
391	8.0K PENDENT (3/4"NPT)	TY4231
360	8.0K UPRIGHT (1/2"NPT)	TY4831*
361	8.0K PENDENT (1/2"NPT)	TY4931*

	SPRINKLER
1	NATURAL BRASS
4	WHITE POLYESTER
3	WHITE (RAL9010)*
9	CHROME PLATED
7	LEAD COATED

	TEMPERATURE RATING
135	135°F/57°C
155	155°F/68°C
175	175°F/79°C
200	200°F/93°C
286	286°F/141°C

* Eastern Hemisphere sales only.

TABLE D
PART NUMBER SELECTION
SERIES TY-FRB PENDENT AND UPRIGHT SPRINKLERS

Limited Warranty

Products manufactured by Tyco Fire & Building Products (TFBP) are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by TFBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by TFBP to be defective shall be either repaired or replaced, at TFBP's sole option. TFBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFBP was informed about the possibility of such damages, and in no event shall TFBP's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

Ordering Procedure

When placing an order, indicate the full product name. Refer to the Price List for complete listing of Part Numbers.

Contact your local distributor for availability.

Sprinkler Assemblies with NPT Thread Connections:
Specify: (Specify Model/SIN), Quick Response, (specify K-factor), (specify temperature rating), Series TY-FRB (specify Pendent or Upright) Sprinkler with (specify type of finish or coating), P/N (specify from Table D).

Recessed Escutcheon:
Specify: Style (10, 20, 30, or 40) Recessed Escutcheon with (specify*) finish, P/N (specify*).

* Refer to Technical Data Sheet TFP770.

Sprinkler Wrench:
Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387.

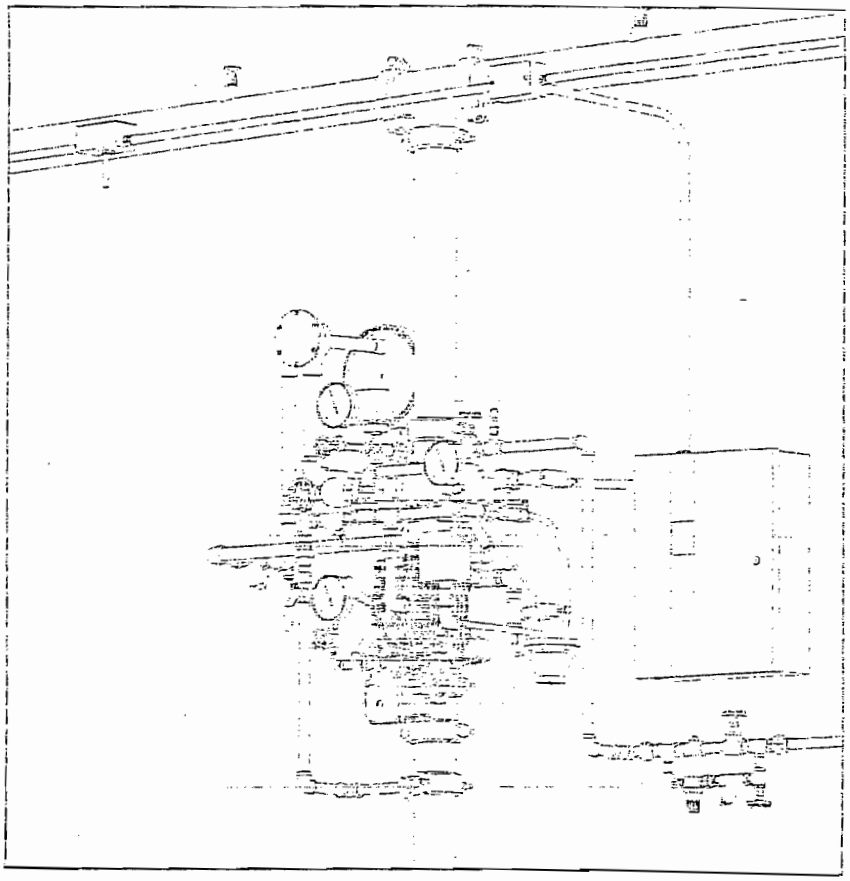
Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001.

tyco / Fire & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500

Preaction System with Model DV-5 Deluge Valve Single Interlock, Supervised — Electric Actuation 1-1/2 thru 8 Inch (DN40 thru DN200)

General Description



The Model DV-5 Supervised Single Interlock Preaction System with Electric Actuation (Fig. 1) utilizes automatic sprinklers and a supplemental detection system. The supplemental detection system is typically comprised of 24 VDC heat detectors, smoke detectors, manual pull stations, etc. Actuation of the detection system automatically operates (releases) the Model DV-5 Deluge Valve, allowing water to flow into the sprinkler piping system and to be discharged from any sprinklers that may be open.

In accordance with the requirements of the National Fire Protection Association, a preaction system employing more than 20 automatic sprinklers is to have the sprinkler piping automatically supervised to monitor the overall integrity of the system. In the case of a Supervised Single Interlock Preaction System, a Riser Check Valve (that does not require the use of priming water) provides an air check so that the system can be automatically pressurized with a nominal supervisory air or nitrogen pressure of 10 psi (0,69 bar). A supervisory low pressure alarm switch that is set to transfer its contacts at nominally 5 psi (0,34 bar), on decreasing pressure, is utilized to indicate whether there are any abnormal leaks in the sprinkler system piping. Loss of air pressure from the system as a result of a damaged sprinkler or broken piping will not cause the DV-5 Valve to open — the air pressure is for supervisory alarm only.

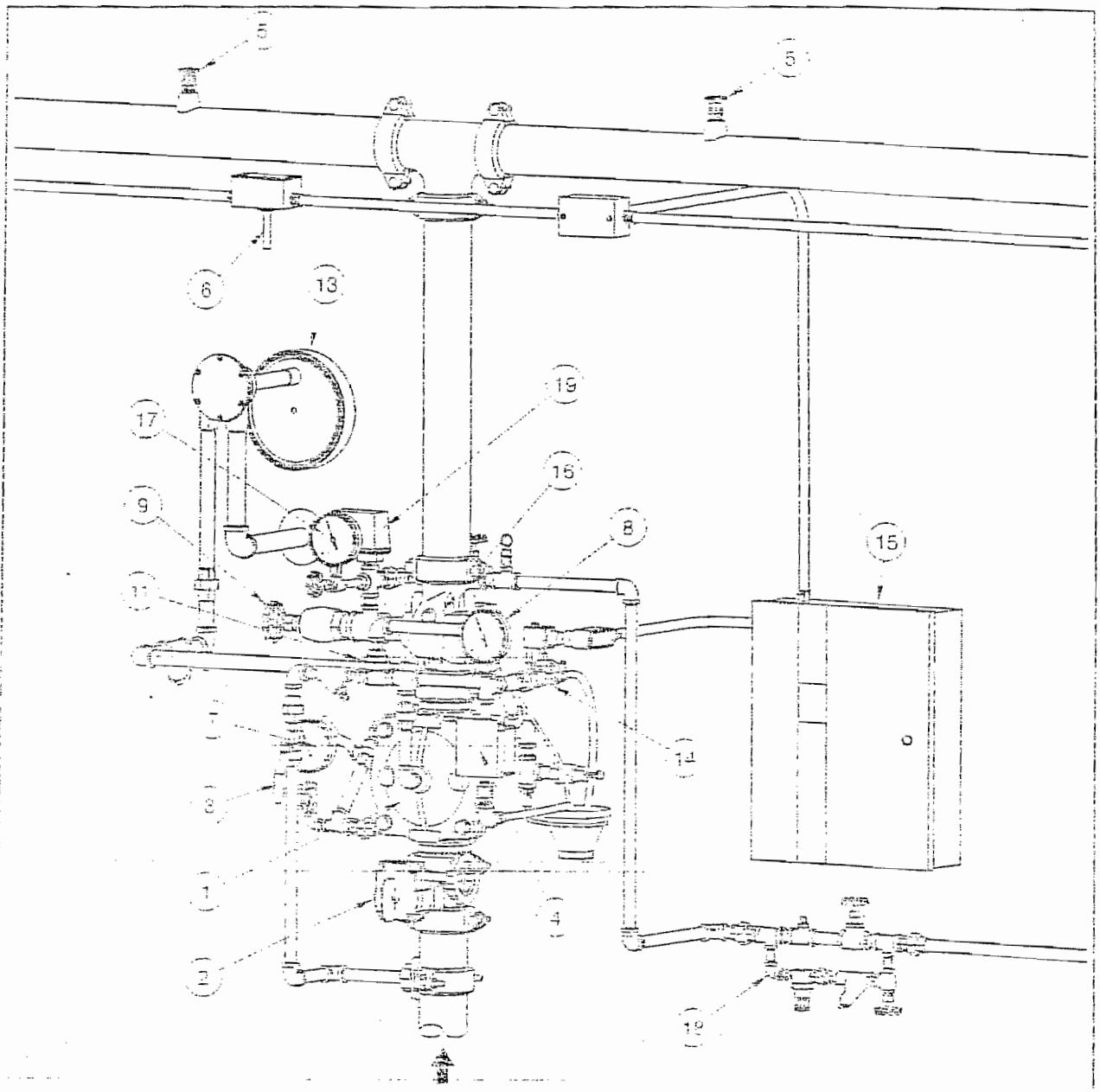
Typically, the system designer selects the detection components for a single interlock preaction system that will respond to a fire sooner than the automatic sprinklers. Consequently, the system will experience a minimal delay in water delivery over that for a wet pipe sprinkler system because the system will have begun to fill with water before a sprinkler operates.

Supervised single interlock preaction systems are generally used to protect areas where there is danger of serious water damage that might result from damaged automatic sprinklers or piping. Typically, such areas include computer rooms, storage areas for valuable artifacts, libraries, and archives.

Single interlock preaction systems are also effectively used to protect properties where a pre-alarm of a possible fire condition may allow time for fire extinguishment by alternate suppression means, prior to a sprinkler discharge. In the event the fire cannot otherwise be extinguished, the preaction sprinkler system will then perform as the primary fire protection system.

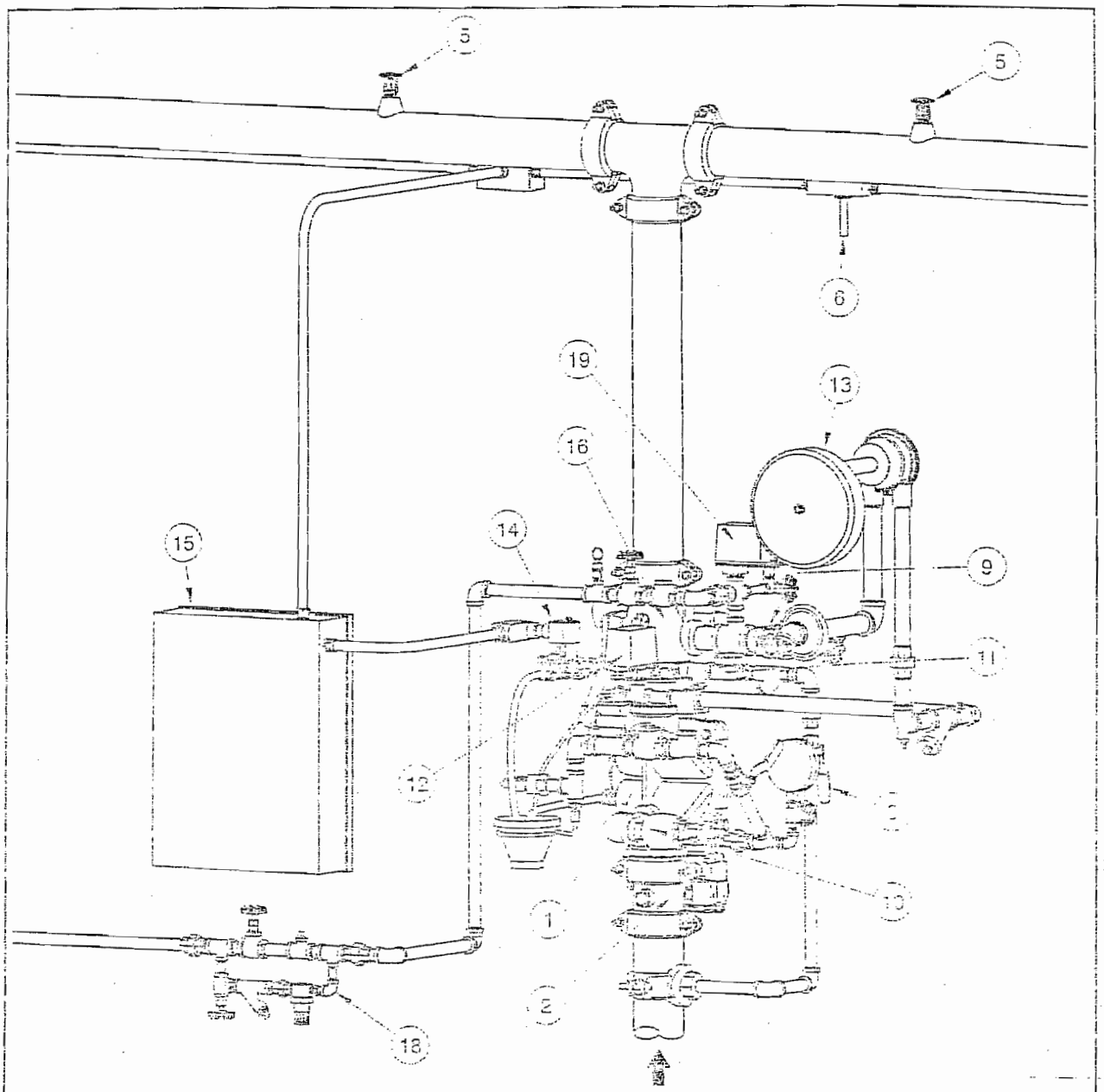
The Model DV-5 Deluge Valve (described in Technical Data Sheet TFP1305) is a diaphragm style valve that depends upon water pressure in the Diaphragm Chamber to hold the Diaphragm closed against the water supply pressure. When the DV-5 Valve is set for service, the Diaphragm

(TEXT CONTINUED ON PAGE 9)



1 - Model DV-5 Deluge Valve
2 - Main Control Valve (N.O.)
3 - Diaphragm Chamber Supply Control Valve (N.O.)
4 - Local Manual Control Station
5 - Automatic Sprinklers
6 - Heat Detectors, Smoke Detectors, etc. (Fire Detection)
7 - Water Supply Pressure Gauge
8 - Diaphragm Chamber Pressure Gauge
9 - System Drain Valve (N.C.)
10 - Main Drain Valve (N.C.) (Shown at Rear of Valve)
11 - Diaphragm Chamber Automatic Shut-Off Valve
12 - Waterflow Pressure Alarm Switch (Shown at Rear of Valve)
13 - Water Motor Alarm (Optional)
14 - Solenoid Valve
15 - Deluge Valve Releasing Panel
16 - Riser Check Valve
17 - Supervisory Air Pressure Gauge
18 - Automatic Supervisory Air/Nitrogen Supply
19 - Supervisory Low Pressure Alarm Switch

FIGURE 1 — PART 1 OF 2
SUPERVISED SINGLE INTERLOCK PREACTION SYSTEM WITH ELECTRIC ACTUATION
— SYSTEM SCHEMATIC (Front View) —



1 - Model DV-5 Deluge Valve
2 - Main Control Valve (N.O.)
3 - Diaphragm Chamber Supply Control Valve (N.O.)
4 - Local Manual Control Station (Shown at Front of Valve)
5 - Automatic Sprinklers
6 - Heat Detectors, Smoke Detectors, etc. (Fire Detection)
7 - Water Supply Pressure Gauge (Shown at Front of Valve)
8 - Diaphragm Chamber Pressure Gauge (Shown at Front of Valve)
9 - System Drain Valve (N.C.)
10 - Main Drain Valve (N.C.)
11 - Diaphragm Chamber Automatic Shut-Off Valve
12 - Waterflow Pressure Alarm Switch
13 - Water Motor Alarm (Optional)
14 - Solenoid Valve
15 - Deluge Valve Releasing Panel
16 - Riser Check Valve
17 - Supervisory Air Pressure Gauge (Shown at Front of Valve)
18 - Automatic Supervisory Air/Nitrogen Supply
19 - Supervisory Low Pressure Alarm Switch

FIGURE 1 — PART 2 OF 2
SUPERVISED SINGLE INTERLOCK PREACTION SYSTEM WITH ELECTRIC ACTUATION
— SYSTEM SCHEMATIC (Rear View) —

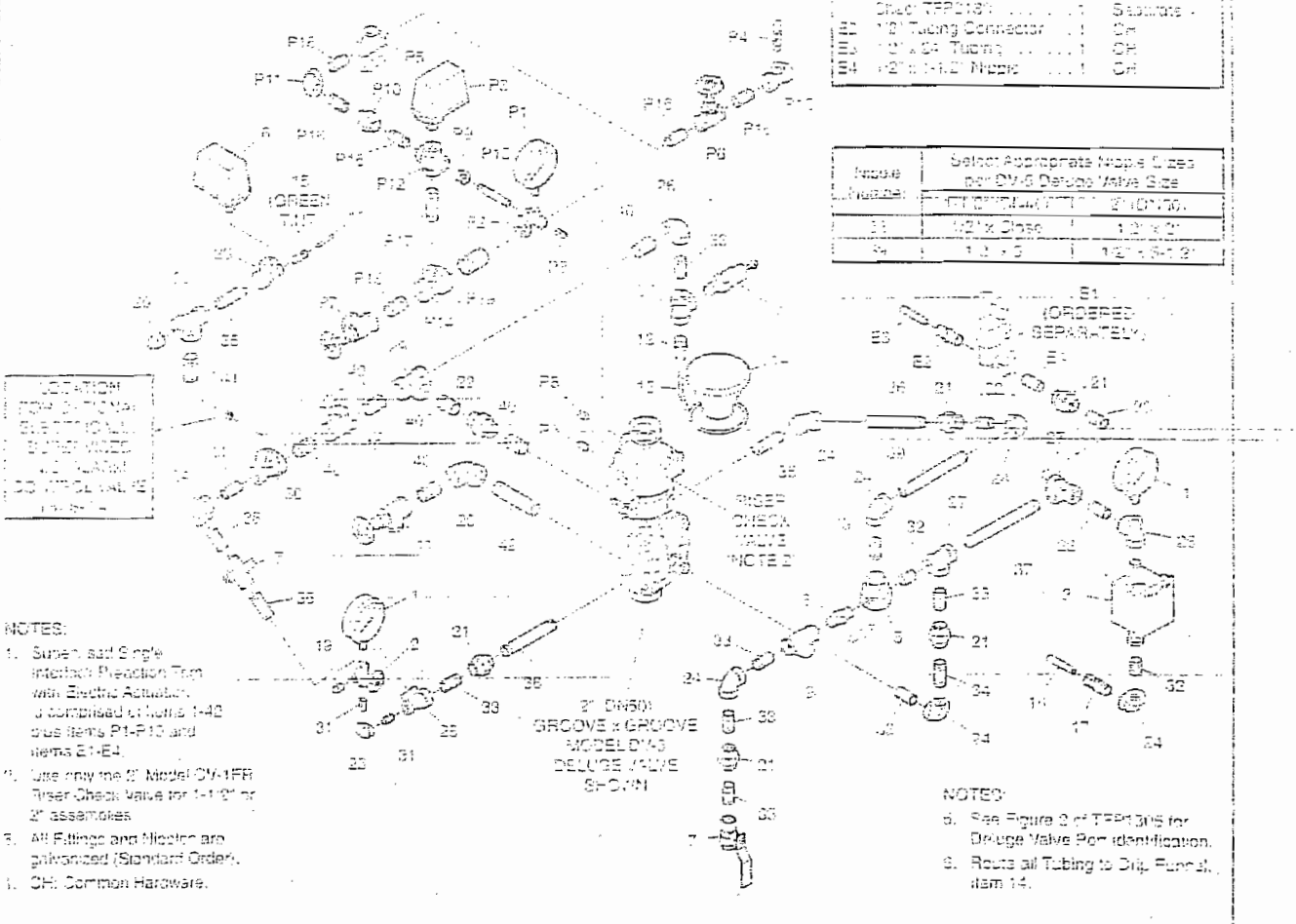
NO.	DESCRIPTION	QTY.	P/N
1	300 psi/ 2000 kPa Water Pressure Gauge	2	99-343-1-005
2	1/4" Gauge Test Valve	1	46-605-1-002
3	Model MC-1 Manual Control Station	1	52-389-3-001
4	Model AD-1 Automatic Drain Valve	1	50-709-3-104
5	Automatic Sprinkler Alarm Test Valve	1	99-343-1-031
6	Diaphragm Pressure Alarm Switch (PS10-2A)	1	2571
7	1-1/2" Ball Valve	2	46-605-1-004
8	1/2" Spring Loaded Check Valve	1	60-002-1-002
9	1/2" Y-Strainer	1	60-009-1-003
10	3/4" Swing Check Valve	1	46-049-1-005
11	3/4" Angle Valve	1	46-049-1-005
12	Drip Funnel Connection	1	99-211-1-005
13	Drip Funnel Bracket	1	99-211-1-010
14	Drip Funnel	1	99-211-1-001
15	3/4" Y-Strainer	1	60-009-1-004
16	1-1/2" x 1½" Bushing	1	CH
17	1/2" Tubing Connector	1	CH
18	1/2" x 60" Tubing	1	CH

NO.	DESCRIPTION	QTY.	P/N
19	1/4" Plug	1	CH
20	3/4" Plug	1	CH
21	1-1/2" Union	6	CH
22	3/4" Union	1	CH
23	1-1/2" 90° Elbow	1	CH
24	1-1/2" 90° Elbow	7	CH
25	3/4" 90° Elbow	1	CH
26	1-1/2" x 1-1/2" x 1-1/2" Tee	1	CH
27	1-1/2" x 1-1/4" x 1-1/2" Tee	2	CH
28	3/4" Tee	1	CH
29	3/4" x 1-1/2" x 3/4" Tee	2	CH
30	1¼" x Close Nipple	1	CH
31	1-1/2" x Close Nipple	11	CH
32	1-1/2" x 1-1/4" Close Nipple	11	CH
33	1-1/2" x 2" Nipple	1	CH
34	1-1/2" x 2-1/2" Nipple	2	CH
35	1-1/2" x 3" Nipple	2	CH
36	1-1/2" x 5" Nipple	1	CH
37	1-1/2" x 7" Nipple	1	CH
38	Select Nipple per Table	3	CH
39	Select Nipple per Table	1	CH
40	3/4" x 1-1/2" Nipple	1	CH
41	3/4" x 3" Nipple	1	CH
42	3/4" x 4" Nipple	1	CH

NO.	DESCRIPTION	QTY.	P/N
P1	250 psi/ 1750 kPa Air Pressure Gauge	1	99-343-1-012
P2	1/4" Gauge Test Valve	1	46-605-1-002
P3	Low Air Pressure Alarm Switch (PS10-2A)	1	2571
P4	½" Pressure Relief Valve	1	99-343-1-010
P5	1½" Swing Check Valve	1	46-049-1-004
P6	1½" Globe Valve	1	46-047-1-004
P7	3/4" Angle Valve	1	46-049-1-005
P8	1-1/2" Plug	3	CH
P9	1-1/2" x 1" Reducing Bushing	1	CH
P10	1-1/2" Union	1	CH
P11	1-1/2" 90° Elbow	1	CH
P12	1" Cross	1	CH
P13	2" x 1/2" x 1-1/2" Tee	1	CH
P14	1" x 3/4" x 1/2" Tee	1	CH
P15	1-1/2" x 3" Nipple	1	CH
P16	1-1/2" x 1-1/2" Nipple	3	CH
P17	1-1/2" x 2-1/2" Nipple	1	CH
P18	1-1/2" x 1-1/2" Nipple	1	CH
P19	1-1/2" x 2" Nipple	1	CH

E1	Solenoid Valve Per Data Sheet TFP2180	1	Ordered Separately
E2	1/2" Tubing Connector	1	CH
E3	1/2" x 24" Tubing	1	CH
E4	1/2" x 1-1/2" Nipple	1	CH

Inside Sprinkler	Select Appropriate Nipple Sizes per DV-5 Deluge Valve Size	
	1-1/2" (DN40)	2" (DN50)
31	1-1/2" x Close	1-1/2" x 2"
34	1-1/2" x 3"	1-1/2" x 5-1/2"



NOTES:

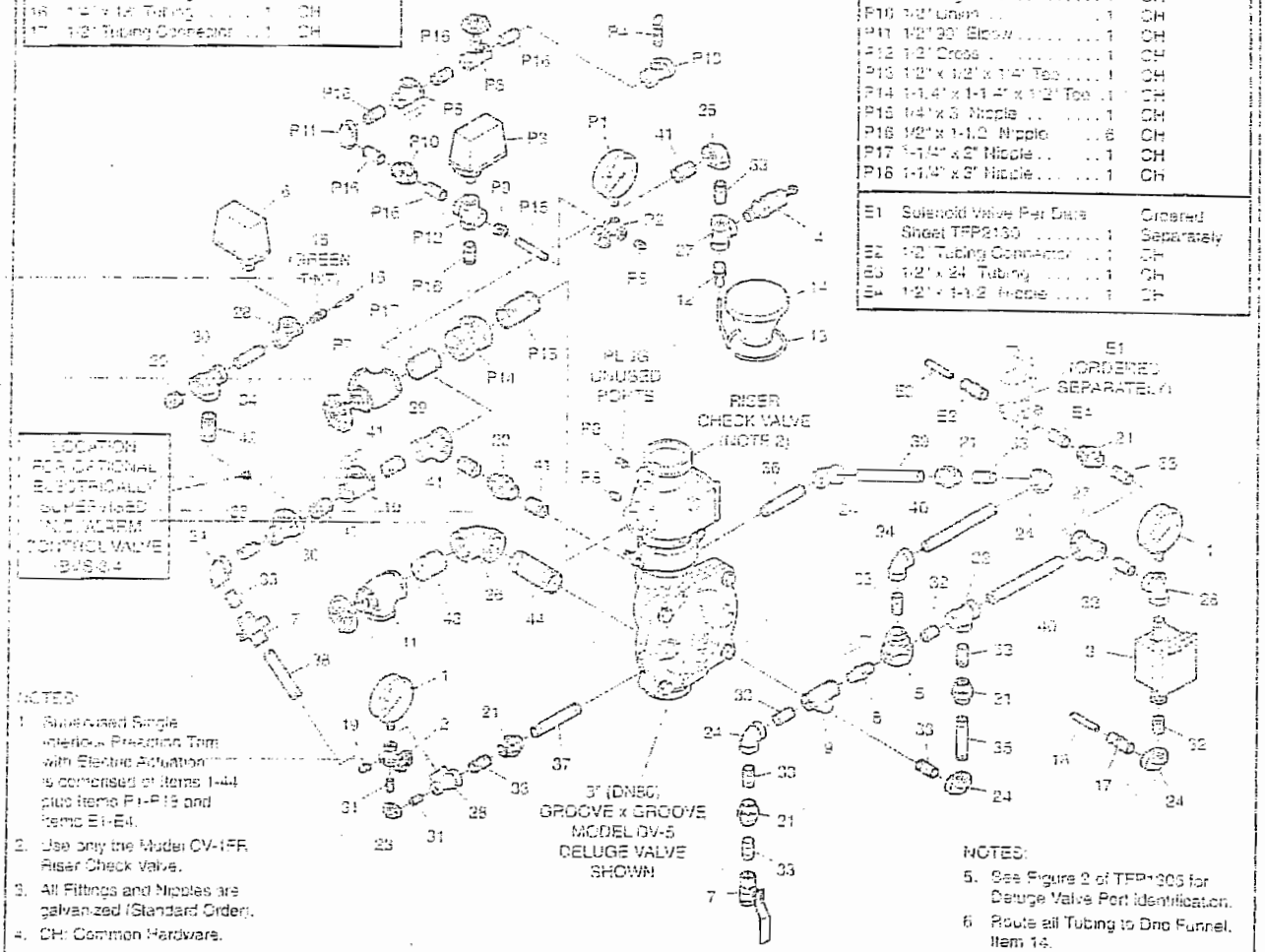
1. Supervised Single Interlock Preaction Trim with Electric Actuation is comprised of Items 1-42 plus Items P1-P19 and Items E1-E4.
2. Use only the 2" Model DV-1FR Riser Check Valve for 1-1/2" or 2" assemblies.
3. All Fittings and Nipples are galvanized (Standard Order).
4. CH: Common Hardware.
5. See Figure 2 of TFP305 for Deluge Valve Port Identification.
6. Route all Tubing to Drip Funnel, Item 14.

FIGURE 2A — PART 1 OF 3
1-1/2 and 2 INCH (DN40 and DN50) MODEL DV-5 DELUGE VALVES
SUPERVISED SINGLE INTERLOCK PREACTION WITH ELECTRIC ACTUATION TRIM (52-478-X-119)
— EXPLODED VIEW —

NO.	DESCRIPTION	QTY.	P/N
1	300 psi 2000 kPa Water Pressure Gauge	2	02-343-1-005
2	1/4" Gauge Test Valve	1	46-005-1-002
3	Model MC-1 Manual Control Station	1	52-089-2-001
4	Model AD-1 Automatic Drain Valve	1	52-768-2-004
5	Automatic Shut-Off Valve, Model ASV-1	1	52-343-1-021
6	Waterflow Pressure Alarm Switch (PS10-2A)	1	2571
7	1/2" Ball Valve	2	46-050-1-004
8	1/2" Spring Loaded Check Valve	1	52-052-1-002
9	1-1/2" Strainer	1	52-353-1-005
10	3/4" Swing Check Valve	1	40-049-1-003
11	1-1/4" Angle Valve	1	40-048-1-007
12	Drip Funnel Connector	1	52-211-1-005
13	Drip Funnel Bracket	1	52-211-1-003
14	Drip Funnel	1	10-047-1-007
15	3/32" Vent Fitting	1	52-052-1-002
16	1/4" x 18" Tubing	1	CH
17	1/2" Tubing Connector	1	CH

NO.	DESCRIPTION	QTY.	P/N
18	1/2" x 15" Tubing	1	CH
19	1/4" Plug	1	CH
20	3/4" Plug	1	CH
21	1/2" Union	5	CH
22	3/4" Union	1	CH
23	1-1/4" 90° Elbow	1	CH
24	1/2" 90° Elbow	7	CH
25	3/4" x 1/2" 90° Elbow	1	CH
26	1-1/4" 90° Elbow	1	CH
27	1/2" Tee	3	CH
28	1/2" x 1/4" x 1/2" Tee	3	CH
29	3/4" Tee	1	CH
30	3/4" x 1/2" x 3/4" Tee	2	CH
31	1/4" x Close Nipple	2	CH
32	1/2" x Close Nipple	2	CH
33	1/2" x 1-1/2" Nipple	10	CH
34	1/2" x 2-1/2" Nipple	1	CH
35	1/2" x 3-1/2" Nipple	1	CH
36	1/2" x 4" Nipple	1	CH
37	1/2" x 4-1/2" Nipple	1	CH

NO.	DESCRIPTION	QTY.	P/N
38	1/2" x 5" Nipple	1	CH
39	1/2" x 5-1/2" Nipple	1	CH
40	1/2" x 7" Nipple	2	CH
41	3/4" x 1-1/2" Nipple	5	CH
42	3/4" x 2" Nipple	1	CH
43	1-1/4" x 2" Nipple	1	CH
44	1-1/4" x 4" Nipple	1	CH
P1	250 psi 1750 kPa Air Pressure Gauge	1	02-343-1-010
P2	1/4" Gauge Test Valve	1	46-005-1-002
P3	Low Air Pressure Alarm Switch (PS10-2A	1	2571
P4	1/4" Pressure Relief Valve	1	52-343-1-010
P5	1/2" Swing Check Valve	1	40-049-1-004
P6	1/2" Globe Valve	1	46-047-1-004
P7	1-1/4" Angle Valve	1	46-048-1-007
P8	1/4" Plug	3	CH
P9	1/2" x 1/4" Reducing Bushing	1	CH
P10	1/2" Union	1	CH
P11	1/2" 90° Elbow	1	CH
P12	1/2" Cross	1	CH
P13	1/2" x 1/2" x 1/4" Tee	1	CH
P14	1-1/4" x 1-1/4" x 1/2" Tee	1	CH
P15	1/4" x 3" Nipple	1	CH
P16	1/2" x 1-1/2" Nipple	6	CH
P17	1-1/4" x 2" Nipple	1	CH
P18	1-1/4" x 3" Nipple	1	CH
E1	Solenoid Valve Per Data Sheet TFP2130	1	Ordered Separately
E2	1/2" Tubing Connector	1	CH
E3	1/2" x 24" Tubing	1	CH
E4	1-1/2" x 1-1/2" Nipple	1	CH



NOTES:

1. Supervised Single Interlock Preaction Trim with Electric Actuation is comprised of Items 1-44 plus Items P1-P18 and Items E1-E4.
2. Use only the Model CV-1FR Riser Check Valve.
3. All Fittings and Nipples are galvanized (Standard Order).
4. CH: Common Hardware.

NOTES:

5. See Figure 2 of TFP1300 for Deluge Valve Port Identification.
6. Route all Tubing to Drip Funnel, Item 14.

FIGURE 2A — PART 2 OF 3
3 INCH (DN80) MODEL DV-5 DELUGE VALVES
SUPERVISED SINGLE INTERLOCK PREACTION WITH ELECTRIC ACTUATION TRIM (52-478-X-116)
— EXPLODED VIEW —

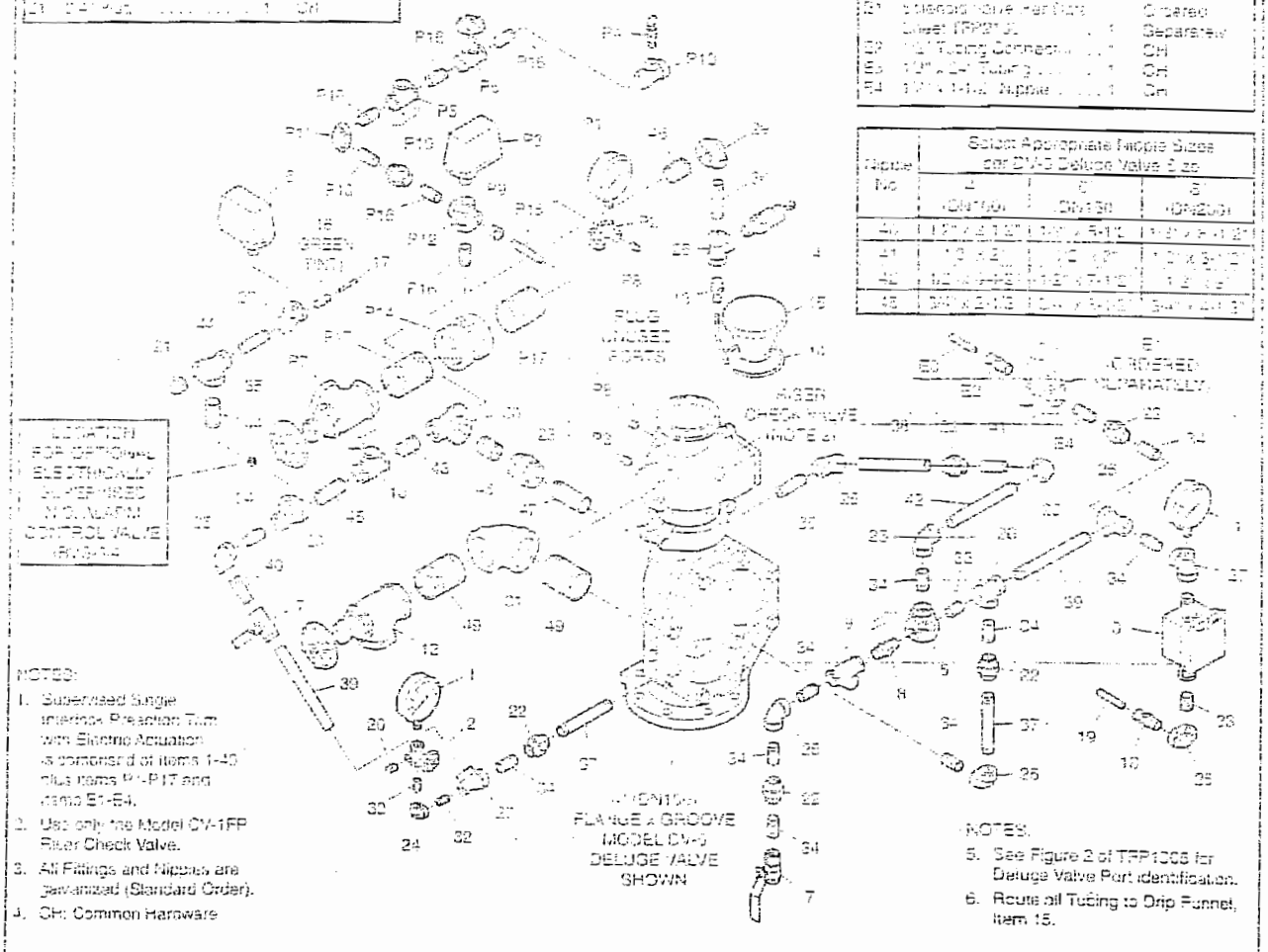
NO.	DESCRIPTION	QTY.	P/N
1	300 psi/ 2000 kPa Water Pressure Gauge	2	82-343-1-005
2	1/4" Gauge Test Valve	1	48-055-1-002
3	Model MC-1 Manual Control Station	1	82-339-6-001
4	Model AD-1 Automatic Drain Valve	1	82-720-6-004
5	Automatic Shut-Off Valve Model ASV-1	1	82-343-1-021
6	Waterflow Pressure Alarm Switch (PS1)-(2A)	1	2571
7	1/2" Ball Valve	2	48-357-1-004
8	1/2" Spring Loaded Check Valve	1	82-355-1-035
9	1.2" Y-Strainer	1	82-333-1-005
10	2" Swing Check Valve	1	48-040-1-020
11	Not Used	0	N/A
12	1" Angle Valve	1	48-048-1-009
13	Drip Funnel Connection	1	82-321-1-005
14	Drip Funnel Bracket	1	82-321-1-038
15	Drip Funnel	1	82-347-1-007
16	Water Level Probe	1	82-332-1-002
17	1/4" x 24" Tubing	1	CH
18	1/2" Tubing Connection	1	CH
19	1/2" x 24" Tubing	1	CH
20	1" Plug	1	CH
21	1/4" Plug	1	CH

NO.	DESCRIPTION	QTY.	P/N
22	1/2" Union	5	CH
23	1" Union	1	CH
24	1/4" 90° Elbow	1	CH
25	1.2" 90° Elbow	7	CH
26	1.0" Tee	1	CH
27	1.2" x 1.4" x 1.2" Tee	3	CH
28	3/4" x 1.2" x 3/4" Tee	2	CH
29	1" x 1.2" 90° Elbow	1	CH
30	1" x 3/4" x 1" Tee	1	CH
31	2" 90° Elbow	1	CH
32	1/4" x Close Nipple	2	CH
33	1.0" x Close Nipple	2	CH
34	1.2" x 1-1/2" Nipple	10	CH
35	1.2" x 2" Nipple	2	CH
36	1.0" x 3" Nipple	1	CH
37	1.0" x 2" Nipple	3	CH
38	1.2" x 3" Nipple	1	CH
39	1.2" x 7" Nipple	2	CH
40	Swept Nipple per Table	2	CH
41	Swept Nipple per Table	2	CH
42	Swept Nipple per Table	2	CH
43	1" x 1-1/2" Nipple	1	CH
44	3/4" x 2" Nipple	1	CH
45	Swept Nipple per Table	2	CH
46	1" x 2" Nipple	2	CH

NO.	DESCRIPTION	QTY.	P/N
47	1" x 3" Nipple	1	CH
48	Not Used	0	N/A
49	2" x 3" Nipple	2	CH
P1	500 psi/ 3500 kPa Air Pressure Gauge	1	82-343-1-010
P2	1/4" Gauge Test Valve	1	48-055-1-002
P3	Low Air Pressure Alarm Switch (PS1)-(2A)	1	2571
P4	Air Pressure Relief Valve	1	82-316-1-019
P5	1.0" Swing Check Valve	1	48-040-1-020
P6	1.0" Globe Valve	1	48-047-1-014
P7	2" Angle Valve	1	48-048-1-026
P8	1/4" Plug	6	CH
P9	1.0" x 1/4" Reducing Bushing	1	CH
P10	1/2" Union	1	CH
P11	1/2" 90° Elbow	1	CH
P12	1/2" Cross	1	CH
P13	1/2" x 1/2" x 1/4" Tee	1	CH
P14	1/2" x 1/2" x 1/2" Tee	1	CH
P15	1/4" x 1" Nipple	1	CH
P16	1/2" x 1-1/2" Nipple	1	CH
P17	3/4" x 3" Nipple	2	CH

S1	Electric Valve Pair Sets Sweat (TFP1420)	1	Ordered Separately
S2	1/2" Tubing Connection	1	CH
S3	1/2" x 24" Tubing	1	CH
S4	1/2" x 1-1/2" Nipple	1	CH

Nipple No.	Select Appropriate Nipple Sizes per DV-5 Deluge Valve Size		
	A (DN150)	C (DN150)	E (DN200)
40	1.2" x 4"	1.2" x 5-1/2"	1.2" x 5-1/2"
41	1.2" x 2"	1.2" x 3"	1.2" x 3"
42	1.2" x 7"	1.2" x 7-1/2"	1.2" x 7-1/2"
43	2" x 2-1/2"	2" x 3-1/2"	2" x 3-1/2"



NOTES:

1. Supervised Single Interlock Preaction Trim with Electric Actuation is comprised of items 1-49 plus items P1-P17 and items S1-S4.
2. Use only the Model CV-1FP Filter Check Valve.
3. All Fittings and Nipples are galvanized (Standard Order).
4. CH: Common Hardware
5. See Figure 2 of TFP1008 for Deluge Valve Port identification.
6. Route all Tubing to Drip Funnel, Item 15.

FIGURE 2A — PART 3 OF 3
4, 6, and 8 INCH (DN100 and DN200) MODEL DV-5 DELUGE VALVES
SUPERVISED SINGLE INTERLOCK PREACTION WITH ELECTRIC ACTUATION TRIM (52-478-X-113)
— EXPLODED VIEW —

NOTES:

1. Use only the 2" Model CV-1FR Riser Check Valve with 1-1/2" and 2" DV-5 Valves. Use corresponding sized Model CV-1FR Riser Check Valves for 3"/4" Model DV-5 Valves.
2. Nipples 1-4 vary in length relative to the Model DV-5 valve used. Select per the table. All other nipples supplied unassembled shall be installed per the appropriate trim illustrated in Figure 2A Part 1, 2, or 3.
3. Inlet & outlet connections in alphabetical order.
4. See Figure 1 of TFP1300 for Deluge Valve Part Identification.
5. Refer to Piping in Trim Figures.

Nipple Number	Select Appropriate Nipple Sizes per DV-5 Deluge Valve Size					
	1-1/2" (DN40)	2" (DN50)	3" (DN80)	4" (DN100)	6" (DN150)	8" (DN200)
1	1/2" x Close	1/2" x 2"	1/2" x 2-1/2"	1/2" x 2-1/2"	1/2" x 5-1/2"	1/2" x 8-1/2"
2	1/2" x Close	1/2" x Close	1/2" x 1-1/2"	1/2" x 2"	1/2" x 3"	1/2" x 3-1/2"
3	1/2" x 5"	1/2" x 5-1/2"	1/2" x 7"	1/2" x 6-1/2"	1/2" x 7-1/2"	1/2" x 8"
4	3/4" x 1-1/2"	3/4" x 1-1/2"	3/4" x 1-1/2"	3/4" x 2-1/2"	3/4" x 5-1/2"	3/4" x 8-1/2"
System Main Drain Size	3/4" NPT	3/4" NPT	1-1/4" NPT	2" NPT	2" NPT	2" NPT
Main Drain Size	3/4" NPT	3/4" NPT	1-1/4" NPT	2" NPT	2" NPT	2" NPT

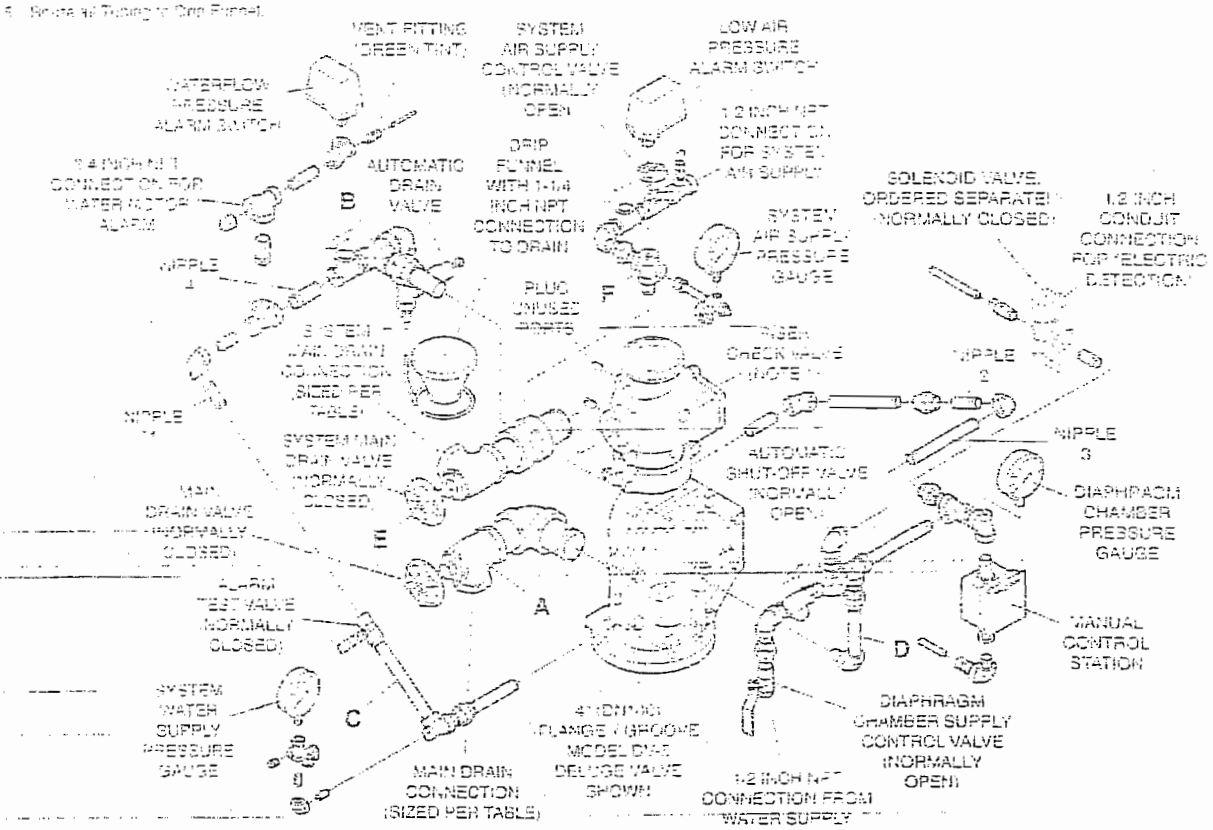


FIGURE 2B
1-1/2 thru 8 INCH (DN40 thru DN200) MODEL DV-5 DELUGE VALVES
SUPERVISED SINGLE INTERLOCK PREACTION WITH ELECTRIC ACTUATION TRIM
— OPERATIONAL COMPONENTS —

Valve Size	Nominal Installation Dimensions in Inches and (mm)											
	A	B	C	D	E	F	G	H	J	K	L	M
1-1/2" (DN40)	7.00 (177.8)	8.88 (225,4)	13.00 (330,2)	10.50 (266,7)	20.50 (520,7)	4.00 (101,6)	5.81 (147,6)	5.81 (147,6)	3.00 (76,2)	7.00 (177,8)	4.00 (101,6)	14.81 (376,2)
2" (DN50)	7.13 (181,0)	9.13 (231,8)	13.00 (330,2)	10.50 (266,7)	21.06 (535,0)	3.13 (79,4)	6.00 (152,4)	6.00 (152,4)	3.00 (76,2)	7.00 (177,8)	3.13 (79,4)	15.38 (390,5)
3" (DN80)	7.81 (198,4)	10.44 (265,1)	14.50 (368,3)	10.50 (266,7)	25.00 (635,0)	1.69 (42,9)	6.69 (170,0)	6.69 (170,0)	4.25 (108,0)	7.00 (177,8)	0.25 (6,4)	21.13 (536,6)
4" (DN100)	10.00 (254,0)	11.75 (298,5)	17.88 (454,0)	10.50 (266,7)	29.13 (739,8)	1.75 (44,5)	6.50 (165,1)	8.56 (217,5)	6.25 (158,8)	7.13 (181,0)	0.38 (9,5)	25.38 (644,5)
6" (DN150)	11.38 (289,0)	14.31 (363,5)	18.75 (476,3)	10.50 (266,7)	31.94 (811,2)	3.50 (88,9)	7.88 (200,0)	9.94 (252,4)	6.25 (158,8)	7.13 (181,0)	1.56 (39,7)	29.63 (752,5)
8" (DN200)	12.00 (304,8)	16.00 (406,4)	21.25 (539,8)	10.50 (266,7)	36.75 (933,5)	1.75 (44,5)	10.75 (273,1)	10.63 (269,9)	6.25 (158,8)	7.13 (181,0)	7.13 (181,0)	36.50 (927,1)

* MINIMUM CLEARANCE.

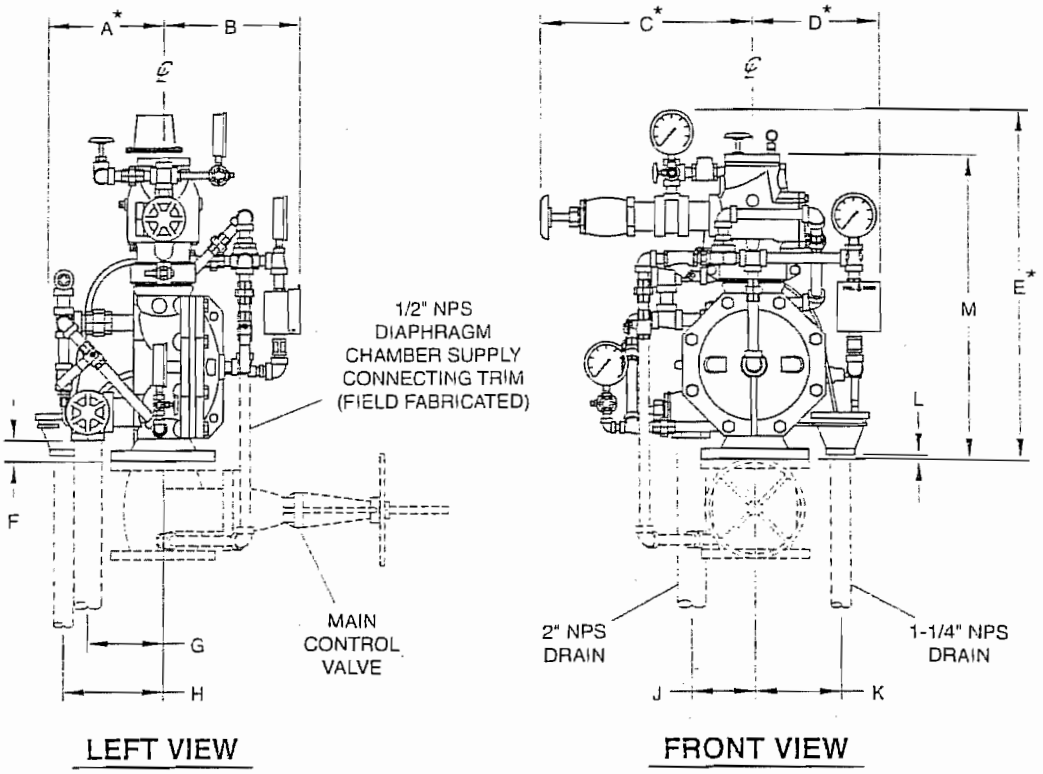


FIGURE 3
1-1/2 thru 8 INCH (DN40 and DN200) MODEL DV-5 DELUGE VALVES
SUPERVISED SINGLE INTERLOCK PREACTION WITH ELECTRIC ACTUATION TRIM
— NOMINAL INSTALLATION DIMENSIONS —

Chamber is pressurized through the trim connections from the inlet side of the system's main control valve, such as an O.S.&Y. gate valve or butterfly valve (Fig. 1).

Operation of an electrical detection device such as a heat sensitive thermostat, smoke detector, or electrical manual control station signals the deluge valve releasing panel to energize the Solenoid Valve. In turn, the energized Solenoid Valve opens to release water from the Diaphragm Chamber faster than it can be replenished through the 1/8 inch (3,2 mm) restriction provided by the Model ASV-1 Automatic Shut-Off Valve in the diaphragm supply connection (Item 5 - Fig. 2A, also described in Technical Data Sheet TFP1384). This results in a rapid pressure drop in the Diaphragm Chamber to below the valve trip point. The water supply pressure then forces the Diaphragm open, permitting water to flow into the system piping, as well as through the Alarm Port to actuate the system alarms.

As water flows into the system, the pilot chamber of the Model ASV-1 Automatic Shut-Off Valve (Item 5 - Fig. 2A) becomes pressurized and the ASV-1 automatically shuts off the diaphragm chamber supply flow to the DV-5 Diaphragm Chamber. Shutting off the diaphragm chamber supply flow prevents the DV-5 Diaphragm Chamber from becoming re-pressurized, thereby preventing inadvertent closing of the DV-5 during a fire (as may be the case should the Solenoid Valve become de-energized after its initial operation).

WARNING

The Model DV-5 Supervised Single Interlock Preaction System with Electric Actuation Trim described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. ***Failure to do so may impair the performance of the related devices.***

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or manufacturer should be contacted with any questions.

Technical Data

Approvals
UL and C-UL Listed. FM Approved.

Deluge Valve
Model DV-5.

Riser Check Valve
Model CV-1FR.

NOTE

1-1/2 inch (DN40) risers utilize a 2 inch (DN50) Riser Check valve in combination with the 1-1/2 inch (DN40) Model DV-5 Deluge Valve.

Valve Trim
The Supervised Single Interlock Preaction System With Electric Actuation Trim (Fig. 2A/2B) forms a part of the laboratory listings and approvals. The trim is necessary for proper operation of the DV-5 Valve.

Each package of trim includes the following items:

- Water Supply Pressure Gauge
- Diaphragm Chamber Pressure Gauge
- Diaphragm Chamber Connections
- Manual Control Station
- Main Drain Valve
- System Drain Valve
- Alarm Test Valve
- Automatic Drain Valve
- System Air Pressure Gauge
- Air Supply Connections
- Low Air Pressure Supervisory Switch
- Waterflow Pressure Alarm Switch

To ease field assembly of the trim arrangement, the trim components are provided partially assembled as shown in Figure 2B.

The trim arrangement is provided with galvanized or black nipples and fittings. The galvanized trim is intended for non-corrosive or corrosive conditions, whereas the black trim is principally intended for use with AFFF systems.

NOTE

When the system pressure is greater than 175 psi (12,1 bar), provision is to be made to replace the standard order 300 psi (20,7 bar) Water Pressure Gauges, shown in Figure 2A/2B with separately ordered 600 psi (41,4 bar) Water Pressure Gauges.

Detection System
In order for a single interlock preaction system to be hydraulically calculated as a wet pipe system, as opposed to a dry pipe sprinkler system, the detection system must be designed to operate sooner than the automatic sprinklers on the sprinkler piping.

The Supervised Single Interlock Preaction System With Electric Actuation Trim provides for electric operation of the DV-5 Valve by a detection system consisting of electrical devices such as heat sensitive thermostats, smoke detectors, and/or electric manual pull stations. Information on the various types of separately ordered Solenoid Valves that may be used with this trim package is given in Technical Data Sheet TFP2180. Nominal installation dimensions for the Supervised Single Interlock Preaction System With Electric Actuation Trim are shown in Figure 3.

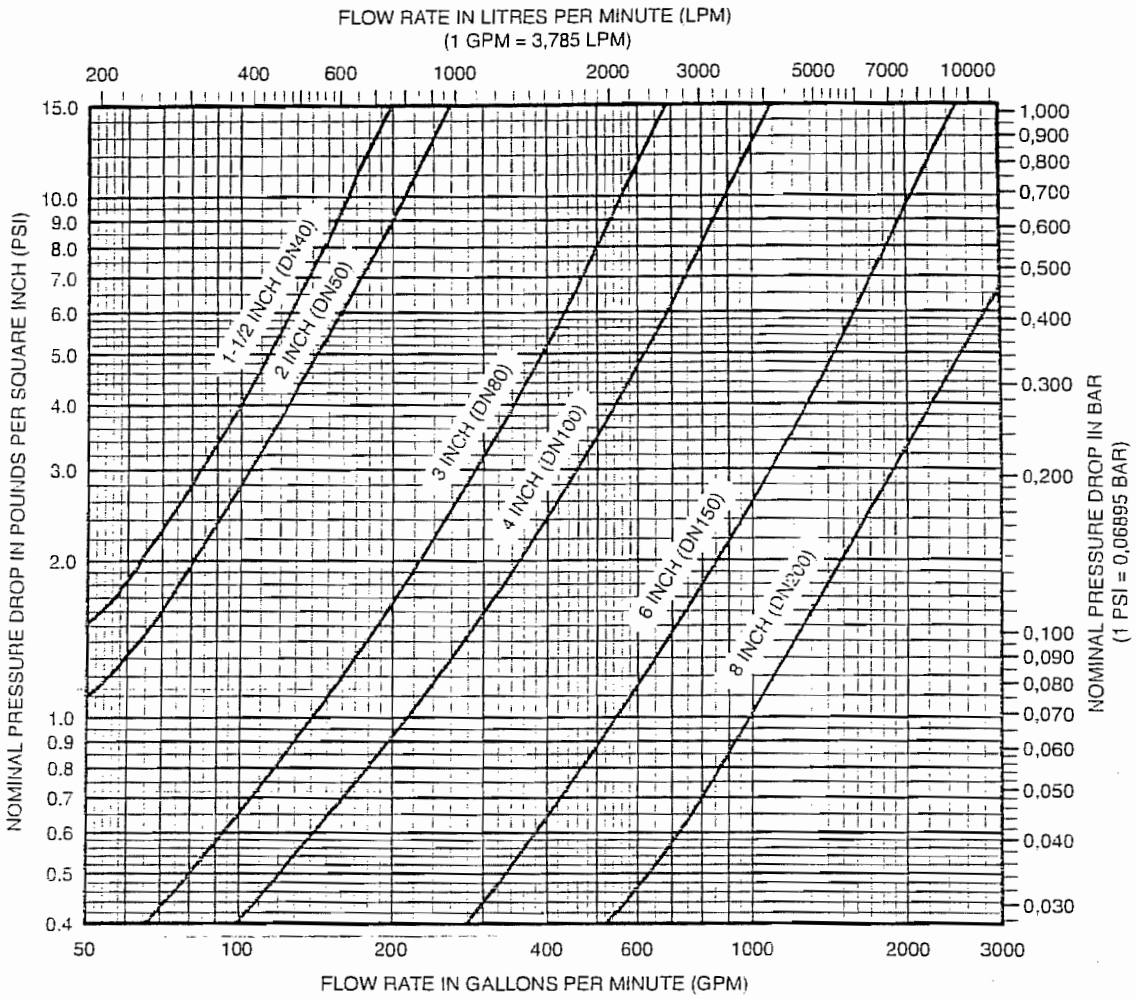
NOTES

Approval by Factory Mutual is contingent on the use of an FM Approved 24VDC Solenoid Valve (P/N 52-287-1-024 or P/N 52-287-1-124). FM only approves solenoid valves for use in non-hazardous locations.

Consult with the Authority Having Jurisdiction regarding installation criteria pertaining to electric actuation circuitry.

The Supervised Single Interlock Preaction System With Electric Actuation Trim is provided with a Model ASV-1 Automatic Shut-Off Valve (Item 5 - Fig. 2A); consequently, the release circuit of the releasing panel need only provide the standard ten minutes of alarm condition intended to energize the Solenoid Valve. After the ten minute duration, should the Solenoid Valve become de-energized and close (especially while operating under battery back-up), the Automatic Shut-Off Valve will have already automatically closed thereby preventing the DV-5 Diaphragm Chamber from becoming re-pressurized and preventing an inadvertent closing of the DV-5 during a fire event.

System Air Pressure Requirements
The supervisory air (nitrogen) pressure is to be 10 plus or minus 2 psi (0,69 plus or minus 0,07 bar). The use of a higher supervisory pressure is subject to approval by the Authority Having Jurisdiction, and it should be understood that the use of a higher supervisory pressure may increase water delivery time. The use of a lower supervisory pressure may prevent clearing the alarm of the Supervisory Low Pressure Alarm Switch (Item P3 - Fig. 2A), which is factory set to alarm at 5 plus or minus 1 psi (0,34 plus or minus 0,07 bar) on decreasing pres-



The approximate friction loss, based on the Hazen and Williams formula and expressed in equivalent length of pipe with C=120, is as follows:

15 feet of 1-1/2 Sch. 40 pipe for the 1-1/2 inch Valve Combination** calculated on a typical flow rate of 100 GPM.
28 feet of 2 inch Sch. 40 pipe for the 2 inch Valve Combination* calculated on a typical flow rate of 175 GPM.
37 feet of 3 inch Sch. 40 pipe for the 3 inch Valve Combination* calculated on a typical flow rate of 350 GPM.
48 feet of 4 inch Sch. 40 pipe for the 4 inch Valve Combination* calculated on a typical flow rate of 600 GPM.
73 feet of 6 inch Sch. 40 pipe for the 6 inch Valve Combination* calculated on a typical flow rate of 1500 GPM.
103 feet of 8 inch Sch. 40 pipe for the 8 inch Valve Combination* calculated on a typical flow rate of 2500 GPM.

GRAPH A
DELUGE AND CHECK VALVE COMBINATION*
— NOMINAL PRESSURE LOSS VERSUS FLOW —

****Model DV-5 Deluge Valve combined with Model CV-1FR Riser Check Valve***

*****1-1/2 inch Model DV-5 Deluge Valve combined with 2 inch Model CV-1FR Riser Check Valve***

sure. The supervisory air supply pressure of 10 plus or minus 2 psi (0,69 plus or minus 0,07 bar) can be provided by any of the following methods. Refer to the applicable data sheet for laboratory approval information.

- Model G16AC812 (self contained) Automatic Supervisory Air Supply described in Gem Technical Data Sheet TD126.
- A maximum 200 psi (13,8 bar) plant air supply in combination with the Model AMD-1 Air Maintenance Device described in Technical Data Sheet TFP1221.
- A maximum 3000 psi (206,9 bar) nitrogen cylinder in combination with the Model AMD-3 Nitrogen Maintenance Device described in Technical Data Sheet TFP1241.

NOTE

The dew point of the air or nitrogen supply, for a system exposed to freezing conditions, must be maintained below the lowest ambient temperature to which the system piping will be exposed. Introduction of moisture into the system piping can create ice build up which could prevent proper operation of the system.

The Supervisory Low Pressure Alarm Switch (Item P3 - Fig. 2A) is factory set at 5 plus or minus 1 psi (0,34 plus or minus 0,07 bar) on decreasing pressure. The Pressure Relief Valve (Item P4- Fig. 2A) is factory set to fully open at 25 plus or minus 2 psi (1,72 plus or minus 0,14 bar) and it begins to crack open at a pressure of about 18 psi (1,24 bar).

Friction Loss

The nominal pressure loss versus flow data for the Model DV-5 Deluge Valve plus Riser Check Valve is provided in Graph A.

Installation

NOTES

1-1/2 inch (DN40) risers utilize a 2 inch (DN50) Riser Check valve in combination with the 1-1/2 inch (DN40) Model DV-5 Deluge Valve.

Proper operation of the Model DV-5 Deluge Valves depends upon their trim being installed in accordance with the instructions given in this Technical Data Sheet. Failure to follow the appropriate trim diagram may prevent the DV-5 Valve from functioning properly, as well as void listings, approvals, and the manufacturer's warranties.

The DV-5 Valve must be installed in a readily visible and accessible location.

The DV-5 Valve and associated trim must be maintained at a minimum temperature of 40°F/4°C.

Heat tracing of the DV-5 Valve or its associated trim is not permitted. Heat tracing can result in the formation of hardened mineral deposits that are capable of preventing proper operation.

The Model DV-5 Deluge Valve is to be installed in accordance with the following criteria:

Step 1. All nipples, fittings, and devices must be clean and free of scale and burrs before installation. Use pipe thread sealant sparingly on male pipe threads only.

Step 2. The DV-5 Valve must be trimmed in accordance with Figure 2A/2B.

Step 3. Care must be taken to ensure that check valves, strainers, globe valves, etc. are installed with the flow arrows in the proper direction.

Step 4. Drain tubing to the drip funnel must be installed with smooth bends that will not restrict flow.

Step 5. The main drain and drip funnel drain may be interconnected provided a check valve is located at least 12 inches (300 mm) below the drip funnel.

Step 6. Suitable provision must be made for disposal of drain water. Drainage water must be directed such that it will not cause accidental damage to property or danger to persons.

Step 7. Connect the Diaphragm Chamber Supply Control Valve to the inlet side of the system's main control valve in order to facilitate setting of the DV-5 Valve (Fig. 3).

Step 8. Unused pressure alarm switch connections must be plugged.

Step 9. A suitable automatic supervisory air (nitrogen) supply, as described in the Technical Data Section, is to be installed in accordance with the applicable Technical Data Sheet and set for 10 plus or minus 2 psi (0,69 plus or minus 0,14 bar).

Step 10. A desiccant dryer, when required for the supervisory air supply, is to be installed between a drip leg and the Model AMD-1 Air Maintenance Device or between the Model G16AC812 Automatic Supervisory Air Supply and the Preaction Trim.

Step 11. The Supervisory Low Pressure Alarm Switch is to be wired to the supervisory alarm initiating circuit of an alarm panel.

Step 12. Conduit and electrical connections are to be made in accordance with the requirements of the authority having jurisdiction and/or the National Electric Code.

Step 13. Before a system hydrostatic test is performed in accordance with NFPA 13 system acceptance test requirements, the DV-5 Diaphragm Chamber is to be depressurized; the Automatic Drain Valve (Item 4, Fig. 2A) is to be temporarily replaced with a 1/2 inch NPT plug, the 3/32 inch Vent Fitting (16 - Fig. 2A) is to be temporarily replaced with a 1/4 inch NPT plug, and the Diaphragm Cover Bolts **must be uniformly and securely tightened using a cross-draw sequence**. After tightening, double-check to make certain that all of the Diaphragm Cover Bolts are securely tightened.

Valve Setting Procedure

Steps 1 through 12 are to be performed when initially setting the Model DV-5 Deluge Valve; after an operational test of the fire protection system; or, after system operation due to a fire.

Step 1. Close the Main Control Valve.

Step 2. Close the Diaphragm Chamber Supply Control Valve and the Supervisory Air Supply Control Valve.

Step 3. Open the Main Drain Valve, System Drain Valve, and all auxiliary drains in the system. After water ceases to discharge, close the System Drain Valve and auxiliary drain valves. Leave the Main Drain Valve open.

Step 4. Depress the plunger of the Automatic Drain Valve to verify that it is open and that the DV-5 Valve is completely drained.

Step 5. Clean the Strainer in the Diaphragm Chamber Supply connection by removing the clean-out plug and strainer basket. The Strainer may be flushed out by momentarily opening the Diaphragm Chamber Supply Control Valve.

Step 6. Reset the actuation system.

Manual Actuation — Push the operating lever up; however, do not close the hinged cover at this time.

Electric Actuation — Reset the electric detection system in accordance with the manufacturer's instructions to de-energize the Solenoid Valve.

Step 7. Open the Diaphragm Chamber Supply Control Valve and allow time for full pressure to build up in the Diaphragm Chamber.

Step 8. Operate (open) the Manual Control Station to vent trapped air from the Diaphragm Chamber. If necessary,

first open the hinged cover, and then fully pull down on the operating lever. SLOWLY close the operating lever, by pushing it up, after aerated water ceases to discharge from the Manual Control Station drain tubing. Close the hinged cover and insert a new break rod in the small hole through the top of the enclosing box.

Step 9. Inspect the drain connections from the Manual Control Station and the Solenoid Valve. Any leaks must be corrected before proceeding to the next step.

Step 10. Verify the ability for the DV-5 Diaphragm to hold pressure as follows:

With the diaphragm chamber pressurized per Step 8, temporarily close the Diaphragm Chamber Supply Control Valve, and monitor the Diaphragm Chamber Pressure Gauge for a drop in pressure.

If a drop in pressure is noted, the DV-5 Diaphragm is to be replaced and/or any leaks must be corrected before proceeding to the next step.

If the Diaphragm Chamber Pressure Gauge does not indicate a drop in pressure, re-open the Diaphragm Chamber Supply Control Valve and proceed to the next step.

Step 11. Replace operated automatic sprinklers on the system piping and then open the Supervisory Air Supply Control Valve and allow the system to automatically re-establish its nominal air pressure of 10 psi (0,69 bar). Observe the Automatic Drain Valve for leaks. If there are leaks, determine/correct the cause of the leakage problem within the Riser Check Valve.

NOTE

In order to prevent the possibility of a subsequent operation of an overheated solder type automatic sprinkler, any solder type automatic sprinklers that were possibly exposed to a temperature greater than their maximum rated ambient must be replaced.

Step 12. Slowly open the Main Control Valve. Close the Main Drain Valve as soon as water discharges from the drain connection. Observe the Automatic Drain Valve for leaks. If there are leaks, determine/correct the cause of the leakage problem. If there are no leaks, the DV-5 Valve is ready to be placed in service and the Main Control Valve must then be fully opened.

NOTES

When the Main Control Valve is opened, the pressure on the Diaphragm Chamber may increase. This increase in pressure is normal, and if the pressure is greater than 250 psi (17,2 bar), the pressure is to be relieved by partially and temporarily opening the Manual Control Station; however, do not allow the pressure as indicated on the Diaphragm Chamber Pressure Gauge to drop below the supply pressure shown on the Water Supply Pressure Gauge, since this action may result in tripping of the DV-5 Valve.

After setting a fire protection system, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.

Care and Maintenance

The following procedures, inspections, and maintenance must be performed as indicated, in addition to any specific requirements of the NFPA, and any impairment must be immediately corrected.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. The installing contractor or product manufacturer should be contacted relative to any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

NOTES

Some of the procedures outlined in this section will result in operation of the associated alarms. Consequently, notification must first be given to the owner and the fire department, central station, or other signal station to which the alarms are connected.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection systems must first be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

Annual Operation Test Procedure

Proper operation of the DV-5 Valve (i.e., opening of the DV-5 Valve as during a fire condition) must be verified at least once a year as follows:

Step 1. If water must be prevented from flowing beyond the riser, perform the following steps.

- Close the Main Control Valve. Open the Main Drain Valve.
- Open the Main Control Valve one turn beyond the position at which water just begins to flow from the Main Drain Valve.
- Close the Main Drain Valve.

Step 2. Test the deluge releasing panel in accordance with the manufacturer's instructions to energize the Solenoid Valve.

NOTE

Be prepared to quickly perform Steps 3, 4, and 5, if water must be prevented from flowing beyond the riser.

Step 3. Verify that the DV-5 Valve has tripped, as indicated by the flow of water into the system.

Step 4. Close the system's Main Control Valve.

Step 5. Close the Diaphragm Chamber Supply Control Valve and the Supervisory Air Supply Control Valve.

Step 6. Reset the DV-5 Deluge Valve in accordance with the Valve Setting Procedure.

Quarterly Waterflow Alarm Test Procedure

Testing of the system waterflow alarms must be performed quarterly. To test the waterflow alarm, open the Alarm Test Valve, which will allow a flow of water to the Waterflow Pressure Alarm Switch and/or Water Motor Alarm. Upon satisfactory completion of the test, close the Alarm Test Valve.

Quarterly Solenoid Valve Test Procedure For Electric Actuation

Proper operation of the Solenoid Valve for electric actuation must be verified at least quarterly as follows:

Step 1. Close the Main Control Valve.

Step 2. Open the Main Drain Valve.

Step 3. Test the deluge releasing panel in accordance with the manufacturer's instructions to energize the solenoid valve.

Step 4. Verify that the flow of water from the Solenoid Valve drain connection increases to a full flow.

Step 5. Verify that the Diaphragm Chamber pressure has decreased to below 25% of the water supply pressure.

Step 6. Reset the electric detection

system in accordance with the manufacturer's instructions to de-energize the solenoid valve. Check the Solenoid Valve drain for leaks. Any leaks must be corrected before proceeding to the next step.

Step 7. Slowly open the Main Control Valve. Close the Main Drain Valve as soon as water discharges from the drain connection. Observe the Automatic Drain Valve for leaks. If there are leaks, determine/correct the cause of the leakage problem. If there are no leaks, the DV-5 Valve is ready to be placed in service and the Main Control Valve must then be fully opened.

NOTE

When the Main Control Valve is opened, the pressure on the Diaphragm Chamber may increase. This increase in pressure is normal, and if the pressure is greater than 250 psi (17,2 bar), the pressure is to be relieved by partially and temporarily opening the Manual Control Station; however, do not allow the pressure as indicated on the Diaphragm Chamber Pressure Gauge to drop below the supply pressure shown on the Water Supply Pressure Gauge, since this action may result in tripping of the DV-5 Valve.

Quarterly Supervisory Low Pressure Alarm Test Procedure

Proper operation of the Supervisory Low Pressure Alarm Switch must be performed quarterly as follows:

Step 1. Crack open the System Main Drain Valve for the Riser Check Valve (Item P7, Figure 2A) to slowly relieve supervisory air pressure from the system. Verify that the Supervisory Low Pressure Alarm Switch is operational and that the low pressure set point is approximately 5 psi (0,34 bar).

Step 2. Close the System Main Drain Valve (Item P7, Figure 2A) and allow the system supervisory pressure of 10 plus or minus 2 psi (0,69 plus or minus 0,14 bar) to be automatically re-established. The Supervisory Low Pressure Alarm Switch should return to its "normal" condition.

Pressure Relief Valve Maintenance

Over pressurization of the system piping with air will result in the opening of the Pressure Relief Valve (Item P4, Fig. 2A). If the Relief Valve continues to bleed air after the system pressure has been reduced to its normal supervisory pressure range of 10 plus or minus 2 psi (0,69 plus or minus 0,14 bar), most likely debris became lodged in the seating area. To help clean the seating area, slowly pull up on the ring at the top of the Relief Valve to allow a full flow of air through the Relief Valve, and then release the ring to allow the Relief Valve to snap closed. Repeat the cleaning procedure as necessary

Limited Warranty

Products manufactured by Tyco Fire Products are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by Tyco Fire Products. No warranty is given for products or components manufactured by companies not affiliated by ownership with Tyco Fire Products or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by Tyco Fire Products to be defective shall be either repaired or replaced, at Tyco Fire Products' sole option. Tyco Fire Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire Products shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

IN NO EVENT SHALL TYCO FIRE PRODUCTS BE LIABLE, IN CONTRACT, TORT, STRICT LIABILITY OR UNDER ANY OTHER LEGAL THEORY, FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LABOR CHARGES, REGARDLESS OF WHETHER TYCO FIRE PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE PRODUCTS' LIABILITY EXCEED AN AMOUNT EQUAL TO THE SALES PRICE.

THE FOREGOING WARRANTY IS MADE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Ordering Procedure

With reference to Table A on Page 14, the following items must be ordered separately:

- Deluge Valve
- Riser Check Valve
- Coupling (Deluge Valve to Riser Check Valve)
- Single Interlock Preaction Trim
- Supervisory Air Supply
- Solenoid Valve
- Accessories

NOTE

1-1/2 inch (DN40) risers utilize a 2 inch (DN50) Riser Check valve in combination with the 1-1/2 inch (DN40) Model DV-5 Deluge Valve.

Part Numbers for factory pre-trimmed Model DV-5 Valves are provided in the Price Book.

Replacement Trim Parts:
Specify: (description) for use with Model DV-5 Deluge Valve, P/N (see Figure 2A).

DELUGE VALVE (SELECT ONE)
P/N's are for American Standard Groove x Groove Connections, and Threaded Ports, For other configurations refer to Technical Data Sheet TFP1305. Specify: (size) Model DV-5 groove x groove Deluge Valve, P/N (specify).

1-1/2 Inch	P/N 52-477-1-919
2 Inch	P/N 52-477-1-910
3 Inch	P/N 52-477-1-912
4 Inch	P/N 52-477-1-913
6 Inch	P/N 52-477-1-915
8 Inch	P/N 52-477-1-916

RISER CHECK VALVE (SELECT ONE)
P/N's are for American Standard Grooved Connections. For other configurations refer to Technical Data Sheet TFP950 for the groove x groove Model CV-1FR Riser Check Valve. Specify: (size), Model CV-1FR groove x groove Riser Check Valve, P/N (specify). *For 1-1/2 inch risers, use the 2 Inch Riser Check Valve.*

2 Inch	P/N 59-590-1-020
3 Inch	P/N 59-590-1-030
4 Inch	P/N 59-590-1-040
6 Inch	P/N 59-590-1-060
8 Inch	P/N 59-590-1-080

COUPLING (SELECT ONE)
P/N's are for American Standard Grooved Connections. For other configurations and finishes refer to Technical Data Sheet TFP1830 or TFP1880. A coupling to attach the Riser Check Valve to the outlet of the Deluge Valve must be separately ordered. Specify: (Size), (Figure #), painted, (description), P/N (specify). *For 1-1/2 inch risers, order an additional Reducing Coupling for the outlet of the 2 inch Riser Check Valve.*

2 x 1-1/2 Inch Figure 716 Painted Reducing Coupling	P/N 7162015ES
2 Inch Figure 772 Painted Rigid Coupling	P/N 77220ASC
3 Inch Figure 772 Painted Rigid Coupling	P/N 77230ASC
4 Inch Figure 772 Painted Rigid Coupling	P/N 77240ASC
6 Inch Figure 772 Painted Rigid Coupling	P/N 77260ASC
8 Inch Figure 772 Painted Rigid Coupling	P/N 77280ASC

PREACTION TRIM (SELECT ONE)
Specify: (specify size and finish — galvanized is standard) Semi-Preassembled Supervised Single Interlock Preaction System With Electric Actuation Trim for Model DV-5 Deluge Valves, P/N (specify).

1-1/2 & 2 Inch Galvanized	P/N 52-478-2-119
1-1/2 & 2 Inch Black	P/N 52-478-1-119
3 Inch Galvanized	P/N 52-478-2-116
3 Inch Black	P/N 52-478-1-116
4, 6 & 8 Inch Galvanized	P/N 52-478-2-113
4, 6 & 8 Inch Black	P/N 52-478-1-113

SUPERVISORY AIR SUPPLY (SELECT ONE)
A device capable of maintaining a nominal system air or nitrogen pressure of nominal 10 psi (0,69 bar) must be separately ordered. Specify: (Specify model and description), P/N (specify).

Model AMD-1 Air Maintenance Oevice (TFP1221)	P/N 52-324-2-002
Model AMD-3 Nitrogen Maintenance Device (TFP1241)	P/N 52-328-2-001
Model G16AC812 Automatic Supervisory Air Supply (TD126)	P/N 52-150-1-001

SOLENOID VALVE (SELECT ONE)
A Solenoid Valve compatible with the anticipated maximum water supply pressure must be ordered separately. Refer to Technical Data Sheet TFP2180 for other voltage ratings and NEMA classifications. Specify: 24 VDC, NEMA 2, 4, and 4X, (specify 175 or 250 psi) Solenoid Valve, P/N (specify).

175 psi	P/N 52-287-1-024
250 psi	P/N 52-287-1-124

ACCESSORIES (AS NEEDED)
Specify: (description), PN (specify).

600 PSI Water Pressure Gauge	P/N 92-343-1-004
Model WMA-1 Water Motor Alarm (TFP921)	P/N 52-630-1-001

TABLE A — ORDERING LIST

tyco / Fire & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500

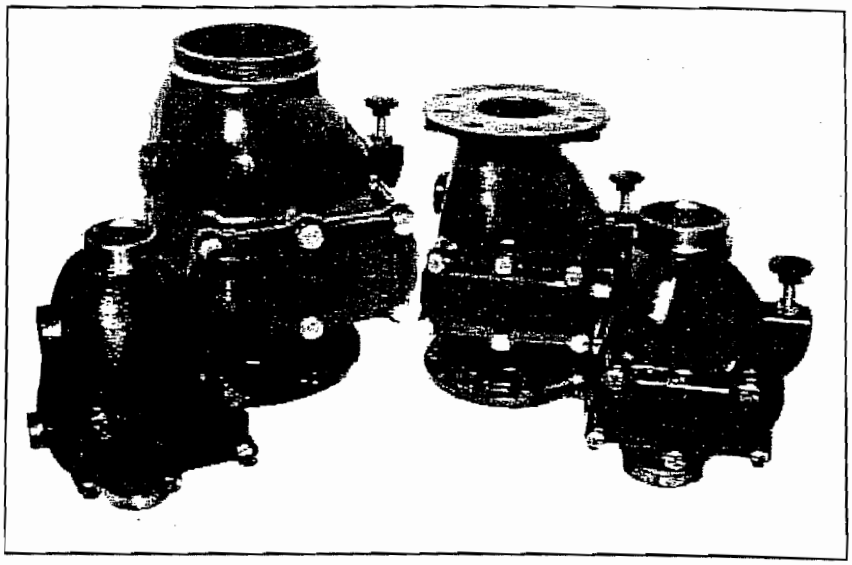
Model DPV-1 Dry Pipe Valve, External Resetting 2-1/2 thru 6 Inch (DN65 thru DN150) 250 psi (17,2 bar)

General Description

The Tyco® Model DPV-1 Dry Pipe Valves are differential valves used to automatically control the flow of water into dry pipe fire protection sprinkler systems upon operation of one or more automatic sprinklers. The DPV-1 also provides for actuation of fire alarms upon system operation. The Model DPV-1 features are as follows:

- External reset.
- 250 psi (17,2 bar) pressure rating.
- Unique offset single clapper design enabling a simple compact valve to minimize installation labor.
- Ductile iron construction to ensure a lightweight valve to minimize shipping cost.
- A variety of inlet and outlet connections.
- Compact, semi-preassembled or fully assembled, and easy to operate valve trim.
- Simple reset procedure through the elimination of priming water.

Dry pipe sprinkler systems are used in unheated warehouses, parking garages, store windows, attic spaces, loading docks, and other areas exposed to freezing temperatures, where water filled pipe cannot be utilized. When set for service, the dry pipe sprinkler system is pressurized with air (or nitrogen). The loss of pressure through an operated automatic sprinkler in response to heat from a fire permits the DPV-1 Dry Pipe Valve to open and allow a flow of water into the sprinkler system piping. Table B establishes the minimum required system air pressure that includes a safety factor to help prevent false operations that might occur due to water supply fluctuations.



Available End Connections and Sizes

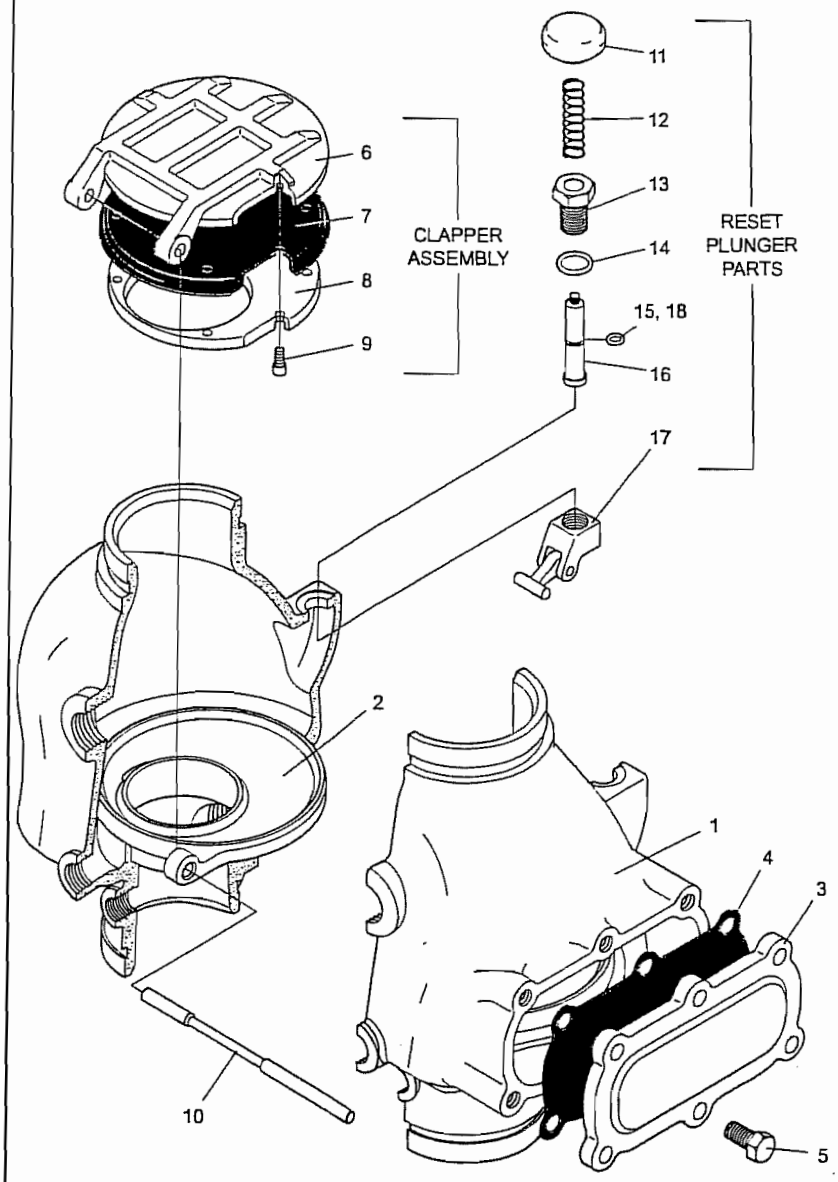
End Connection	Nominal Valve Size			
	2-1/2 Inch (DN65)	3 Inch (DN80)	4 Inch (DN100)	6 Inch (DN150)
Flange x Flange	N/A	N/A	●	●
Flange x Groove	N/A	N/A	●	●
Groove x Groove	●	●	●	●

● Available
N/A Not Available

WARNING

The Model DPV-1 Dry Pipe Valves described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. ***Failure to do so may impair the performance of these devices.***

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or manufacturer should be contacted with any questions.



NO.	DESCRIPTION	QTY.	REF.
1	Valve Body	1	NR
2	Air and Water Seat	1	NR
3	Handhole Cover	1	NR
4	Handhole Cover Gasket	1	See (b)
5	1/2-13 UNC x 1" Hex Head Cap Screw: 2-1/2 & 3 Inch Valves	5	CH
	4 Inch Valve	6	CH
6	Clapper	1	See (a)
7	Clapper Facing	1	See (a) or (b)
8	Clapper Facing Retaining Plate	1	See (a)
9	2-1/2 and 3 Inch Valves: 1/4" x 3/8" Long #10-32 Shoulder Screw	5	See (a)
	4 Inch Valve: 1/4-20 UNC x 1/2" Socket Head Cap Screw	7	See (a)
10	Clapper Hinge Pin	1	See (a)
11	Reset Knob	1	See (c)
12	Reset Spring	1	See (c)
13	Reset Bushing	1	See (c)
14	Reset Bushing O-Ring	1	See (b) or (c)
15	Reset Plunger O-Ring	1	See (b) or (c)
16	Reset Plunger	1	See (c)
17	Reset Latch Subassembly	1	See (c)
18	Dow Corning FS3452 Flourosilicone Grease, 1.5 g	1	See (b) or (c)

NR: Not Replaceable
CH: Common Hardware

REPLACEMENT PARTS		
NO.	DESCRIPTION	P/N
(a)	Clapper Assembly Includes Items 6-10:	
	2-1/2 & 3 Inch Valves	92-309-2-203
	4 Inch Valve	92-309-2-403
(b)	Repair Parts Kit Includes Items 4, 7, 14, 15, & 18:	
	2-1/2 & 3 Inch Valves	92-309-1-204
	4 Inch Valve	92-309-1-404
(c)	Reset Plunger Parts Kit Includes Items: 11 through 18	92-309-1-405

FIGURE 1 — Part 1 of 2
MODEL DPV-1 DRY PIPE VALVES
2-1/2, 3, and 4 INCH (DN65, DN80, and DN100)
— ASSEMBLY —

NO.	DESCRIPTION	QTY.	REF.
1	Valve Body	1	NR
2	Air and Water Seat	1	NR
3	Water Seal O-Ring	1	NR
4	Air Seal O-Ring	1	NR

NO.	DESCRIPTION	QTY.	REF.
5	3/8-16 UNC x 1" Socket Head Cap Screw	8	NR
6	Handhole Cover	1	NR
7	Handhole Cover Gasket	1	See (b)

NO.	DESCRIPTION	QTY.	REF.
8	5/8-11 UNC x 1" Hex Head Cap Screw	6	CH
9	Clapper	1	See (a)
10	Clapper Facing	1	See (a) or (b)
11	Clapper Facing Retaining Plate	1	See (a)
12	1/4-20 UNC x 1/2" Socket Head Cap Screw	9	See (a)
13	Clapper Hinge Pin	1	See (a)
14	Reset Knob	1	See (c)
15	Reset Spring	1	See (c)
16	Reset Bushing	1	See (c)
17	Reset Bushing O-Ring	1	See (b) or (c)
18	Reset Plunger O-Ring	1	See (b) or (c)
19	Reset Plunger	1	See (c)
20	Reset Latch Subassembly	1	See (c)
21	Dow Corning FS3452 Flourosilicone Grease, 1.5 g	1	See (b) or (c)

NR: Not Replaceable
CH: Common Hardware

REPLACEMENT PARTS		
NO.	DESCRIPTION	P/N
(a)	Clapper Assembly Includes Items: 9 through 13	92-309-2-603
(b)	Repair Parts Kit Includes Items: 7, 10, 17, 18, 21	92-309-1-604
(c)	Reset Plunger Parts Kit Includes Items: 14 through 21	92-309-1-405

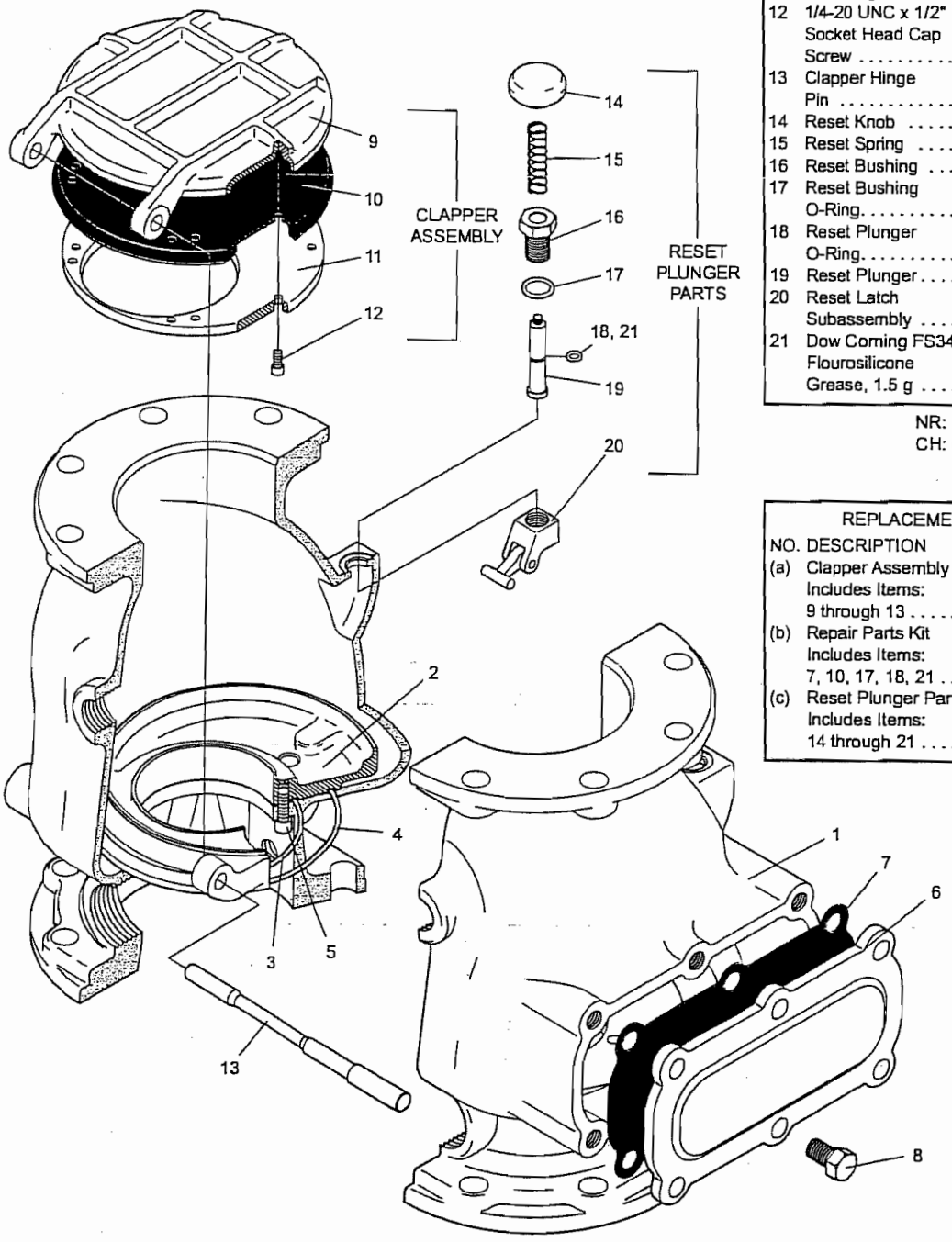


FIGURE 1 — Part 2 of 2
MODEL DPV-1 DRY PIPE VALVES
6 INCH (DN150)
— ASSEMBLY —

Technical Data

Approvals:
UL and C-UL Listed. FM Approved. NYC under MEA 172-02-E (4 and 6 inch).

Dry Pipe Valve:
The Model DPV-1 Dry Pipe Valves are for vertical installations (flow going up), and they are rated for use at a maximum service pressure of 250 psi (17,2 bar). The Valve dimensions are shown in Figure 7.

Flanged connections are available drilled per ANSI, ISO, AS, and JIS specifications (Ref. Table A). The grooved outlet connections, as applicable, are cut in accordance with standard groove specifications for steel pipe. They are suitable for use with grooved end pipe couplings that are listed or approved for fire protection system service. Available combinations of inlet and outlet connections are detailed in the Ordering Procedure section.

Threaded port connections of valves having flanges drilled to ANSI, AS, or JIS specifications are NPT threaded per ANSI Standard B1.20.1. Threaded port connections of valves having flanges drilled to ISO are available either threaded per ISO 7/1 or NPT threaded per ANSI Standard B1.20.1. Valves with NPT threaded ports will readily accept the trim arrangements detailed in Figures 4, 5, and 6.

Components of the DPV-1 Valves are shown in Figure 1. The Body and Handhole Cover are ductile iron. The Handhole Cover Gasket is neoprene, and the Clapper Facing is EPDM. The Air/Water Seat Ring is brass, the Clapper is bronze or aluminum bronze, and both the Clapper Retaining Plate and Latch are bronze. The Hinge Pin is aluminum bronze, and the fasteners for the Handhole Cover are carbon steel.

Valve Trim:
Installation dimensions are given in Figure 7, and the Valve Trim is illustrated in Figures 4, 5, and 6. The Valve Trim forms a part of the laboratory listings and approval of the DPV-1 Valve and is necessary for the proper operation of the DPV-1 Valve. Each package of trim includes the following items:

- Water Supply Pressure Gauge
- System Air Pressure Gauge
- Air Supply Connections
- Main Drain Valve
- Low Body Drain Valve
- Alarm Test Valve
- Automatic Drain Valve
- Drip Funnel
- Connections For Optional Quick Opening Device (Accelerator)

NOTE

When the system pressure is greater than 175 psi (12,1 bar), provision is to be made to replace the standard order 300 psi (20,7 bar) Water Pressure gauge with a separately ordered 600 psi (41,4 bar) Water Pressure Gauge.

Air Supply:
Table B shows the system air pressure requirements as a function of the water supply pressure. The air (or nitrogen) pressure in the sprinkler system is recommended to be automatically maintained by using one of the following pressure maintenance devices, as appropriate:

- Model AMD-1 Air Maintenance Device (pressure reducing type).
- Model AMD-2 Air Maintenance Device (compressor control type).
- Model AMD-3 Nitrogen Maintenance Device (high pressure reducing type).

The Pressure Relief Valve provided with the valve trim is factory set to relieve at a pressure of approximately 45 psi (3,1 bar). If the normal system air pressure is less than or exceeds 40 psi (2,8 bar), then the pressure Relief Valve must be reset to relieve at a pressure that is in accordance with the Authority Having Jurisdiction.

Quick Opening Device:

As an option, the Model DPV-1 Dry Pipe Valve may be equipped with the Model QRS Electronic Dry Pipe Valve Accelerator (4 and 6 inch sizes) as detailed in Technical Data Sheet TFP1100 or the Model ACC-1 Mechanical Dry Pipe Valve Accelerator (2-1/2, 3, 4, and 6 inch sizes) as detailed in Technical Data Sheet TFP1112.

The QRS or the ACC-1 is used to reduce the time to valve actuation following the operation of one or more automatic sprinklers. In some cases the use of a quick opening device such as the QRS or the ACC-1 may be required to meet the requirements of the National Fire Protection Association to meet water delivery times.

Patents:
U.S.A. Patent No. 6,557,645

Nominal Valve Size	Flange Drilling Specification — Nominal Dimensions in Inches and (mm)											
	ANSI B16.1 [1] (Class 125)			ISO 7005-2 (PN16) [2]			JIS B 2210 (10K)			AS 2129 (Table E)		
	Dim. A	Dim. B	Qty. N	Dim. A	Dim. B	Qty. N	Dim. A	Dim. B	Qty. N	Dim. A	Dim. B	Qty. N
4 Inch (DN100)	7.50 (190,5)	0.75 (19,0)	8	7.09 (180,0)	0.75 (19,0)	8	6.89 (175,0)	0.59 (15,0)	8	7.00 (178,0)	0.71 (18,0)	8
6 Inch (DN150)	9.50 (241,3)	0.88 (22,2)	8	9.45 (240,0)	0.91 (23,0)	8	9.45 (240,0)	0.75 (19,0)	8	9.25 (235,0)	0.87 (22,0)	8

[1] Same drilling as for ANSI B16.5 (Class 150) and ANSI B16.42 (Class 150).

[2] Same drilling as for BS 4504 Section 3.2 (PN16) and DIN 2532 (PN16).

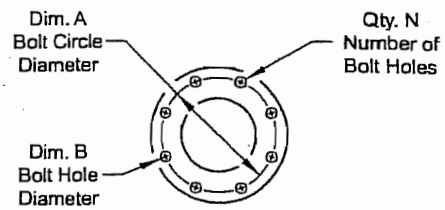
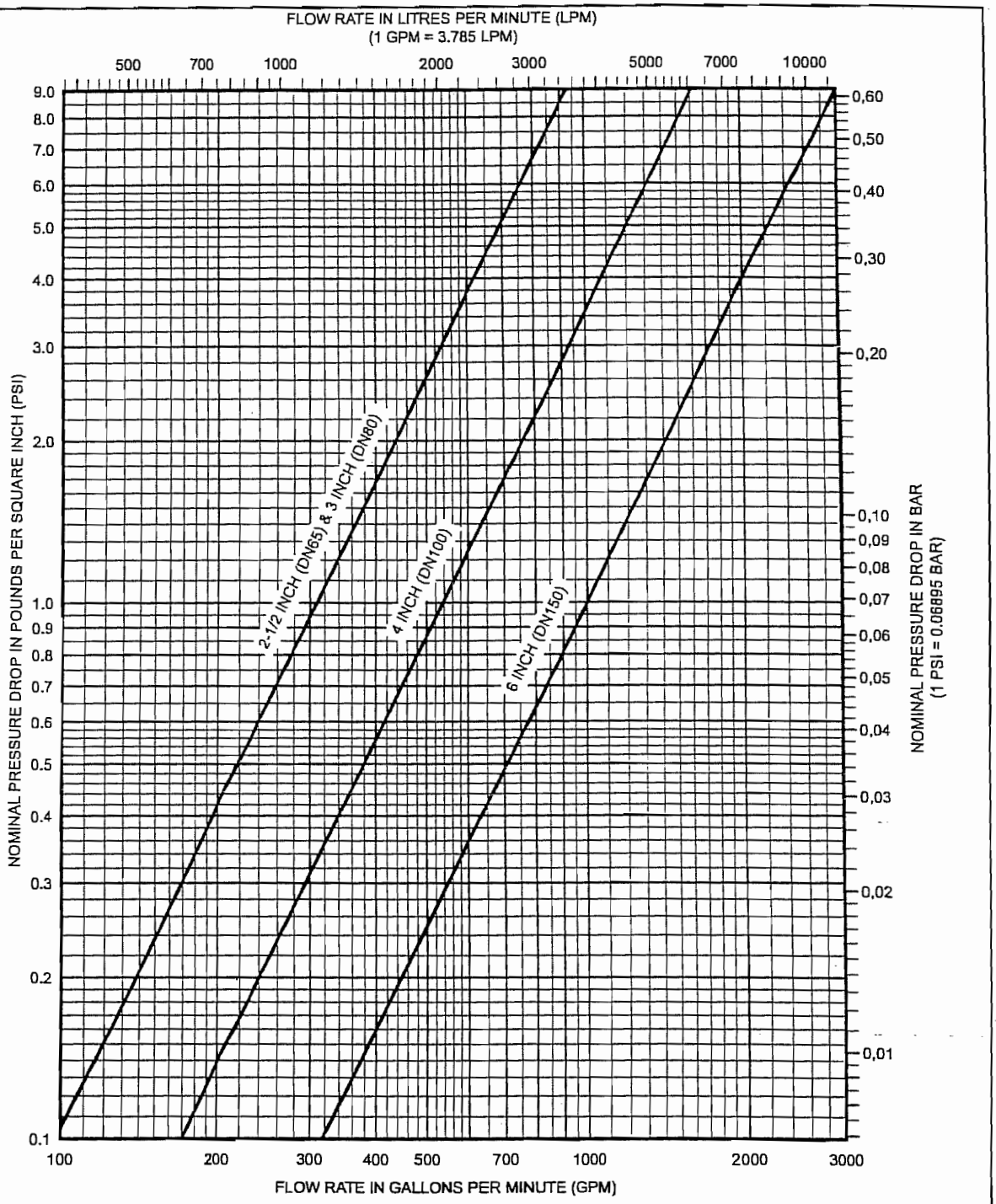


TABLE A
DIMENSIONAL SPECIFICATIONS
FOR SELECTION OF FLANGE DRILLING



The approximate friction losses, based on the Hazen and Williams formula and expressed in equivalent length of Schedule 40 pipe with C=100 are as follows:

2.2 feet for the 2-1/2 inch valve at a typical flow rate of 250 GPM
4.9 feet for the 3 inch valve at a typical flow rate of 350 GPM
8.9 feet for the 4 inch valve at at typical flow rate of 600 GPM
22 feet for the 6 inch valve at a typical flow rate of 1500 GPM

FIGURE 2
MODEL DPV-1 DRY PIPE VALVES
— NOMINAL PRESSURE LOSS VERSUS FLOW —

Operating Principles

The Model DPV-1 Dry Pipe Valve is a differential type valve that utilizes a substantially lower system (air or nitrogen) pressure than the supply (water) pressure, to maintain the set position shown in Figure 3A. The differential nature of the DPV-1 is based on the area difference between the air seat and the water seat in combination with the ratio of the radial difference from the Hinge Pin to the center of the Water Seat and the Hinge Pin to the center of the Air Seat. The difference is such that 1 psi (0,07 bar) of system air pressure can hold approximately 5.5 psi (0,38 bar) of water supply pressure.

Table B establishes the minimum required system air pressure that includes a safety factor to help prevent false operations that occur due to water supply fluctuations.

The Intermediate Chamber of the DPV-1 is formed by the area between the Air Seat and Water Seat as shown in Figure 3B. The Intermediate Chamber normally remains at atmospheric pressure through the Alarm Port connection and the valve trim to the normally open Automatic Drain Valve (Fig. 4, 5, or 6). Having the Intermediate Chamber, Figure 3B, open to atmosphere is critical to the DPV-1 Valve remaining set, otherwise the full resulting pressure of the system air pressure on top of the Clapper Assembly cannot be realized.

For example and assuming a water supply pressure of 100 psi (6,9 bar), if the system air pressure is 25 psi (1,7 bar) and there was 15 psi (1,0 bar) pressure trapped in the Intermediate Chamber, the resulting pressure across the top of the Clapper would only be 10 psi (0,7 bar). This pressure would be insufficient to hold the Clapper Assembly closed against a water supply pressure of 100 psi (6,9 bar). It is for this reason that the plunger of the Automatic Drain Valve must be depressed during several of the resetting steps, as well as during inspections, making certain that the Automatic Drain Valve is open.

When one or more automatic sprinklers operate in response to a fire, air pressure within the system piping is relieved through the open sprinklers. When the air pressure is sufficiently reduced, the water pressure overcomes the differential holding the Clapper Assembly closed and the Clapper Assembly swings clear of the water seat, as shown in Figure 3C, This action permits water flow into the system piping and subsequently to be discharged from any open sprinklers. Also, with the Clapper Assembly open, the intermediate chamber is pressurized and water flows through the alarm port (Ref. Figure 3B) at the rear of the DPV-1 Valve to actuate system water flow alarms. The flow from the alarm port is also sufficient to close the otherwise normally open Automatic Drain Valve in the valve trim.

After a valve actuation and upon subsequent closing of a system main control valve to stop water flow, the Clapper Assembly will latch open as shown in Figure 3D. Latching open of the DPV-1 will permit complete draining of the system (including any loose scale) through the main drain port.

During the valve resetting procedure and after the system is completely drained, the external reset knob can be easily depressed to externally unlatch the Clapper Assembly as shown in Figure 3E. As such, the Clapper Assembly is returned to its normal set position to facilitate setting of the dry pipe sprinkler system, without having to remove the Handhole Cover.

Maximum Water Supply Pressure, psi	System Air Pressure Range, psi
20	10
60	15 - 23
80	20 - 28
100	25 - 33
120	30 - 38
145	35 - 43
165	40 - 48
185	45 - 53
205	50 - 58
225	55 - 63
250	60 - 68

TABLE B
SYSTEM AIR PRESSURE REQUIREMENTS

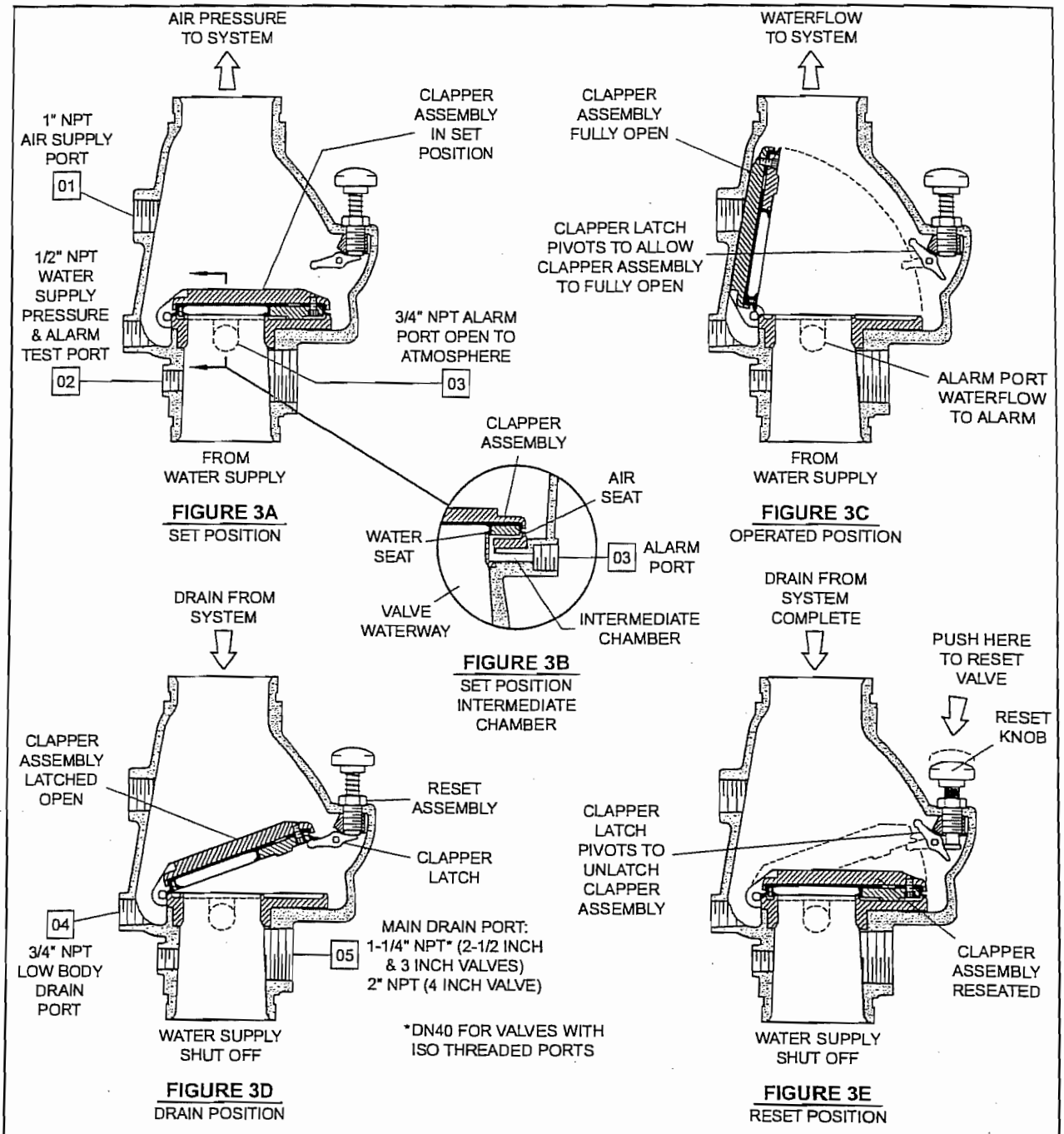


FIGURE 3 — Part 1 of 2
MODEL DPV-1 DRY PIPE VALVES
2-1/2, 3, and 4 INCH (DN65, DN80, and DN100)
— SET AND OPEN POSITIONS —

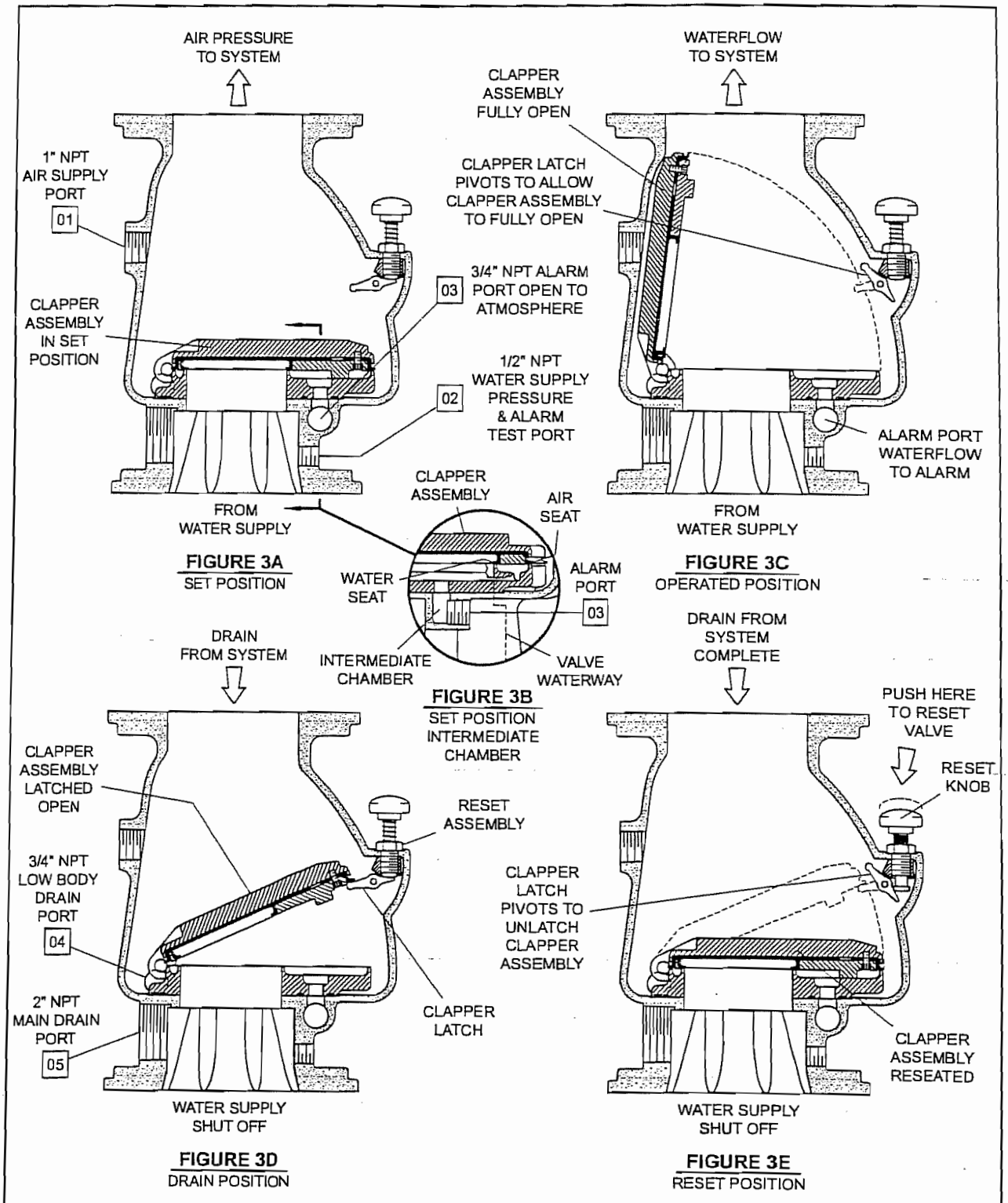
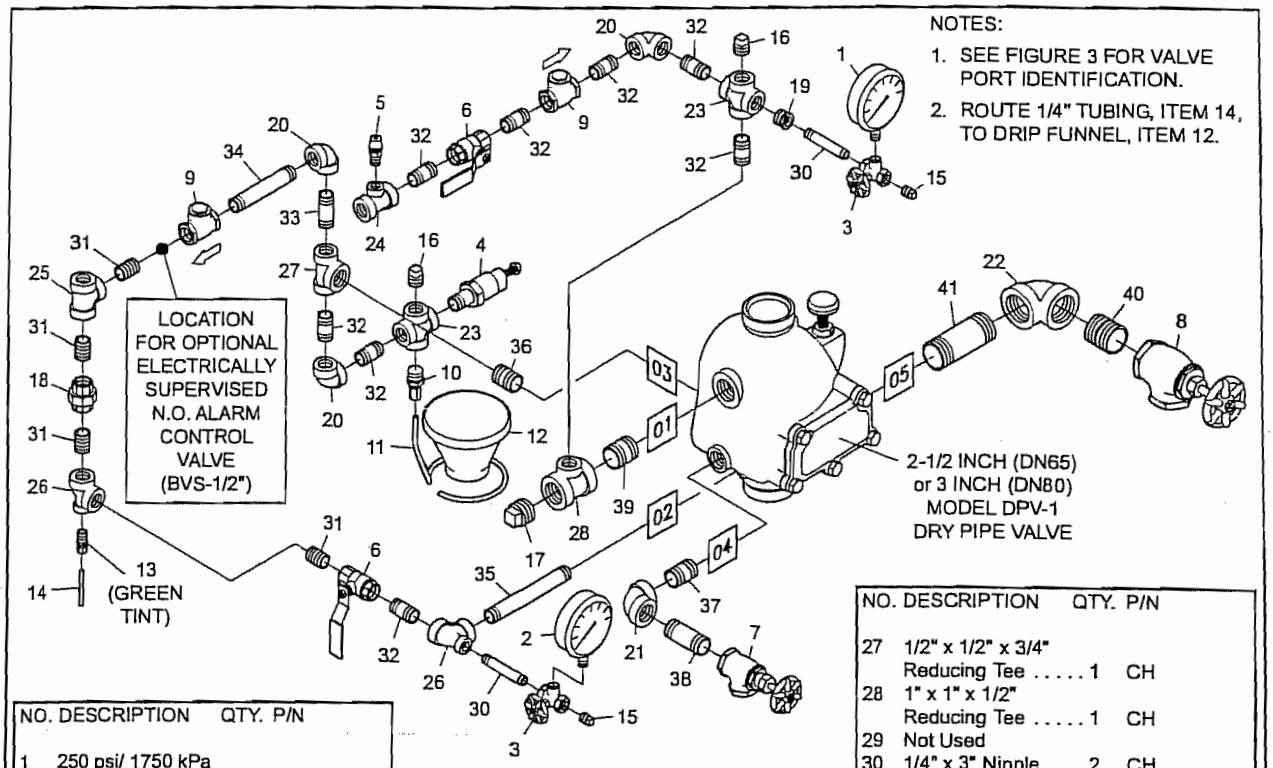


FIGURE 3 — Part 2 of 2
MODEL DPV-1 DRY PIPE VALVES
6 INCH (DN150)
— SET AND OPEN POSITIONS —



NO.	DESCRIPTION	QTY.	P/N
1	250 psi/ 1750 kPa Air Pressure Gauge	1	92-343-1-012
2	300 psi/ 2000 kPa Water Pressure Gauge	1	92-343-1-005
3	1/4" Gauge Test Valve	2	46-005-1-002
4	Model AD-1 Automatic Drain Valve	1	52-793-2-004
5	1/4" Pressure Relief Valve	1	92-343-1-020
6	1/2" Ball Valve	2	46-050-1-004
7	3/4" Angle Valve	1	46-048-1-005
8	1-1/4" Angle Valve	1	46-048-1-007
9	1/2" Swing Check Valve	2	46-049-1-004
10	Drip Funnel Connector	1	92-211-1-005
11	Drip Funnel Bracket	1	92-211-1-003
12	Drip Funnel	1	92-343-1-007

NO.	DESCRIPTION	QTY.	P/N
13	3/32" Vent Fitting	1	92-032-1-002
14	1/4" Tube, 18" Long	1	CH
15	1/4" Plug	2	CH
16	1/2" Plug	2	CH
17	1" Plug	1	CH
18	1/2" Union	1	CH
19	1/2" x 1/4" Reducing Bushing	1	CH
20	1/2" 90° Elbow	3	CH
21	3/4" 90° Elbow	1	CH
22	1-1/4" 90° Elbow	1	CH
23	1/2" Cross	2	CH
24	1/2" x 1/2" x 1/4" Reducing Tee	1	CH
25	1/2" Tee	1	CH
26	1/2" x 1/4" x 1/2" Reducing Tee	2	CH

NO.	DESCRIPTION	QTY.	P/N
27	1/2" x 1/2" x 3/4" Reducing Tee	1	CH
28	1" x 1" x 1/2" Reducing Tee	1	CH
29	Not Used		
30	1/4" x 3" Nipple	2	CH
31	1/2" x Close Nipple	4	CH
32	1/2" x 1-1/2" Nipple	8	CH
33	1/2" x 2" Nipple	1	CH
34	1/2" x 4-1/2" Nipple	1	CH
35	1/2" x 6" Nipple	1	CH
36	3/4" x Close Nipple	1	CH
37	3/4" x 1-1/2" Nipple	1	CH
38	3/4" x 2-1/2" Nipple	1	CH
39	1" x Close Nipple	1	CH
40	1-1/4" x Close Nipple	1	CH
41	1-1/4" x 4" Nipple	1	CH

All Fittings and Nipples are Galvanized

CH: Common Hardware

FIGURE 4 — Part 1 of 2
2-1/2 and 3 INCH (DN65 and DN80) MODEL DPV-1 DRY PIPE VALVES
— EXPLODED VIEW OF VALVE TRIM —

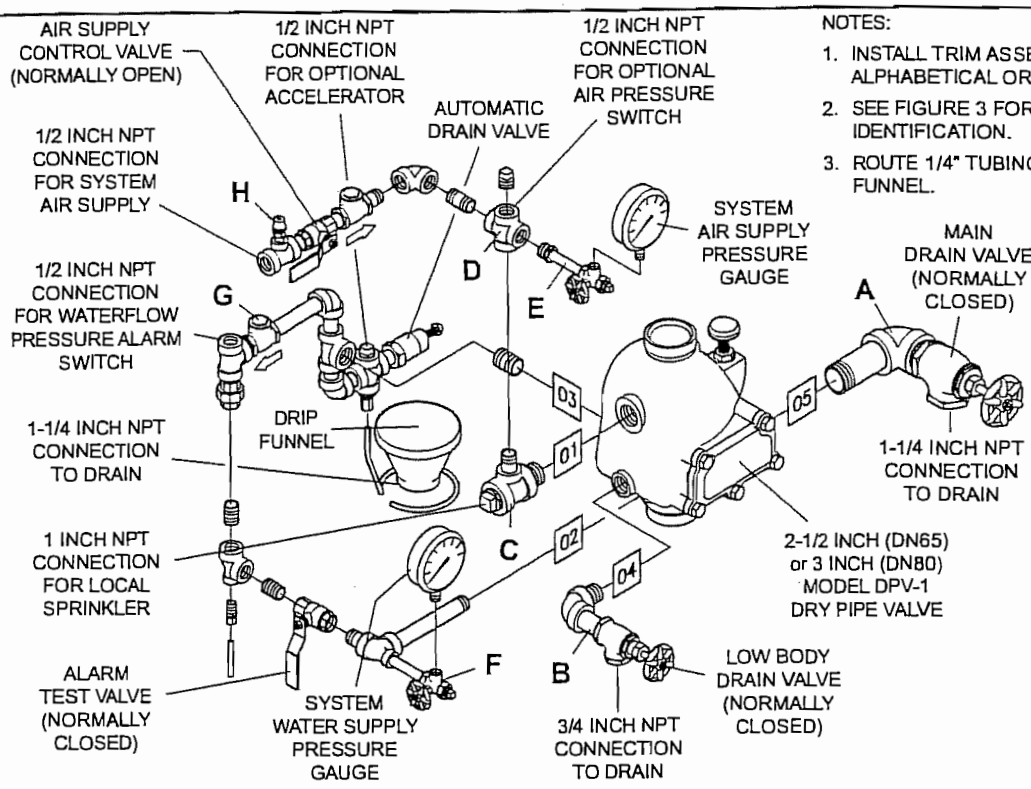
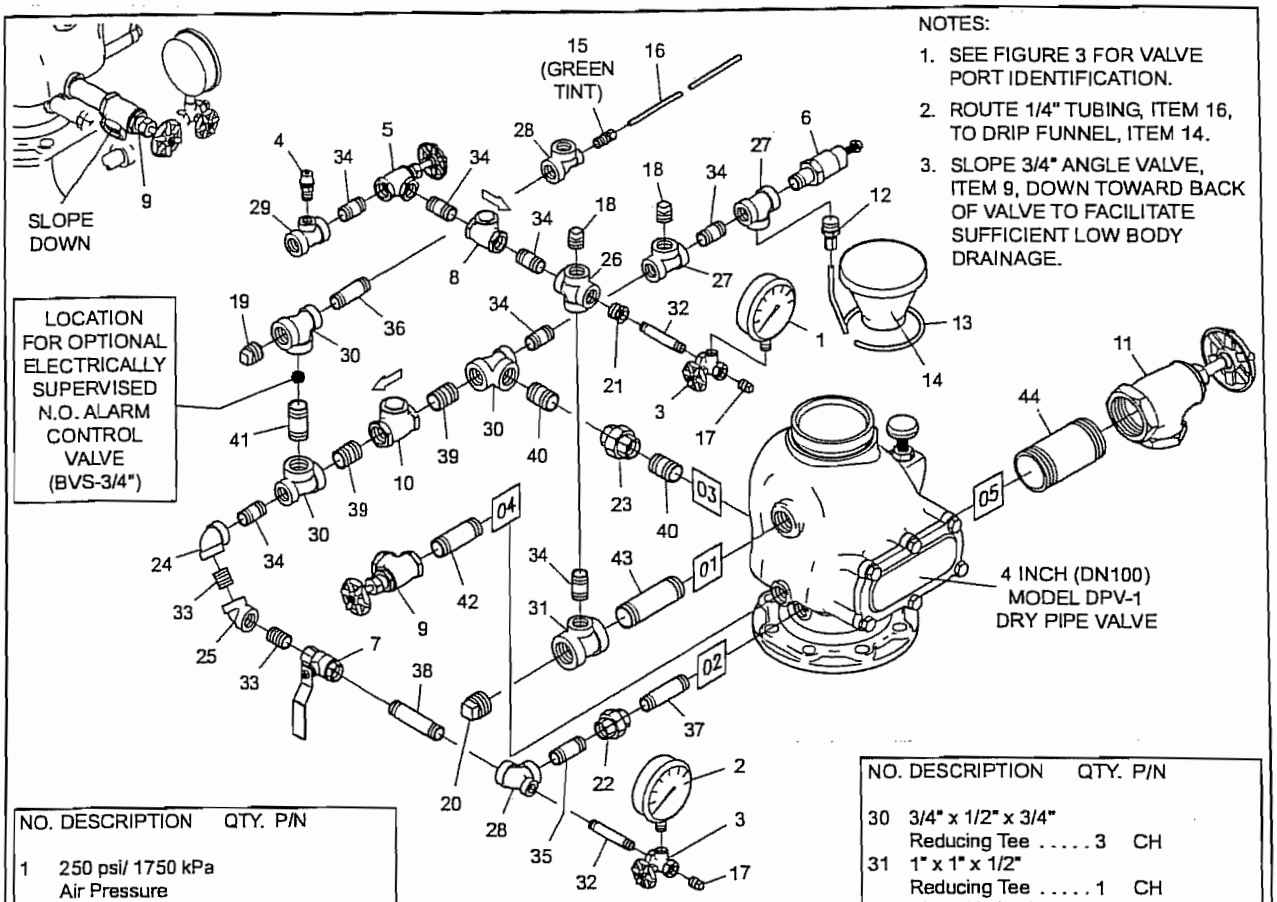


FIGURE 4 — Part 2 of 2
2-1/2 and 3 INCH (DN65 and DN80) MODEL DPV-1 DRY PIPE VALVES
— ASSEMBLY PROCEDURE FOR VALVE TRIM —



NO.	DESCRIPTION	QTY.	P/N
1	250 psi/ 1750 kPa Air Pressure Gauge	1	92-343-1-012
2	300 psi/ 2000 kPa Water Pressure Gauge	1	92-343-1-005
3	1/4" Gauge Test Valve	2	46-005-1-002
4	1/4" Pressure Relief Valve	1	92-343-1-020
5	1/2" Angle Valve	1	46-048-1-004
6	Model AD-1 Automatic Drain Valve	1	52-793-2-004
7	1/2" Ball Valve	1	46-050-1-004
8	1/2" Swing Check Valve	1	46-049-1-004
9	3/4" Angle Valve	1	46-048-1-005
10	3/4" Swing Check Valve	1	46-049-1-005
11	2" Angle Valve	1	46-048-1-009
12	Drip Funnel Connector	1	92-211-1-005
13	Drip Funnel Bracket	1	92-211-1-003
14	Drip Funnel	1	92-343-1-007

NO.	DESCRIPTION	QTY.	P/N
15	3/32" Vent Fitting	1	92-032-1-002
16	1/4" Tube, 24" Long	1	CH
17	1/4" Plug	2	CH
18	1/2" Plug	2	CH
19	3/4" Plug	1	CH
20	1" Plug	1	CH
21	1/2" x 1/4" Reducing Bushing	1	CH
22	1/2" Union	1	CH
23	3/4" Union	1	CH
24	1/2" 90° Elbow	1	CH
25	1/2" 45° Elbow	1	CH
26	1/2" Cross	1	CH
27	1/2" Tee	2	CH
28	1/2" x 1/4" x 1/2" Reducing Tee	2	CH
29	1/2" x 1/2" x 1/4" Reducing Tee	1	CH

NO.	DESCRIPTION	QTY.	P/N
30	3/4" x 1/2" x 3/4" Reducing Tee	3	CH
31	1" x 1" x 1/2" Reducing Tee	1	CH
32	1/4" x 3" Nipple	2	CH
33	1/2" x Close Nipple	2	CH
34	1/2" x 1-1/2" Nipple	7	CH
35	1/2" x 2" Nipple	1	CH
36	1/2" x 2-1/2" Nipple	1	CH
37	1/2" x 3" Nipple	1	CH
38	1/2" x 3-1/2" Nipple	1	CH
39	3/4" x Close Nipple	2	CH
40	3/4" x 1-1/2" Nipple	2	CH
41	3/4" x 2" Nipple	1	CH
42	3/4" x 3" Nipple	1	CH
43	1" x 4" Nipple	1	CH
44	2" x 4-1/2" Nipple	1	CH

All Fittings and Nipples are Galvanized

CH: Common Hardware

FIGURE 5 — Part 1 of 2
4 INCH (DN100) MODEL DPV-1 DRY PIPE VALVES
— EXPLODED VIEW OF VALVE TRIM —

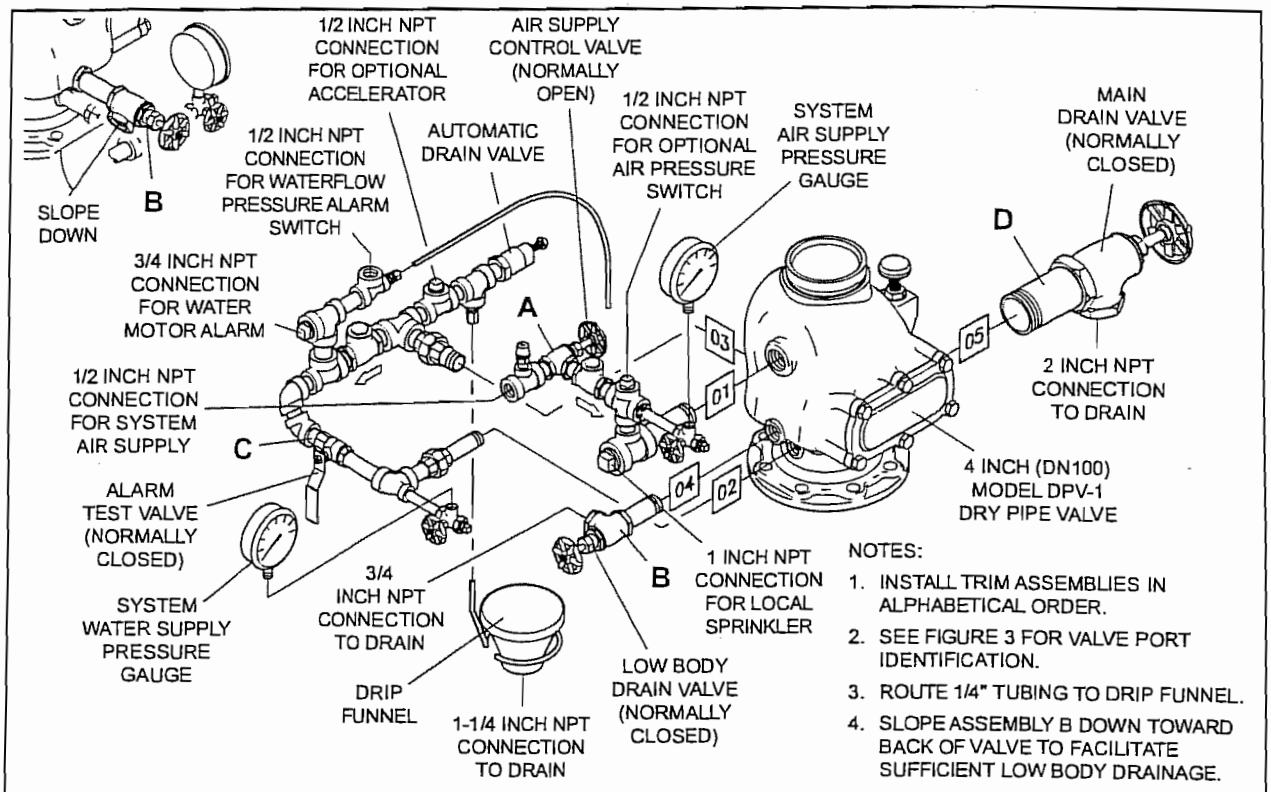
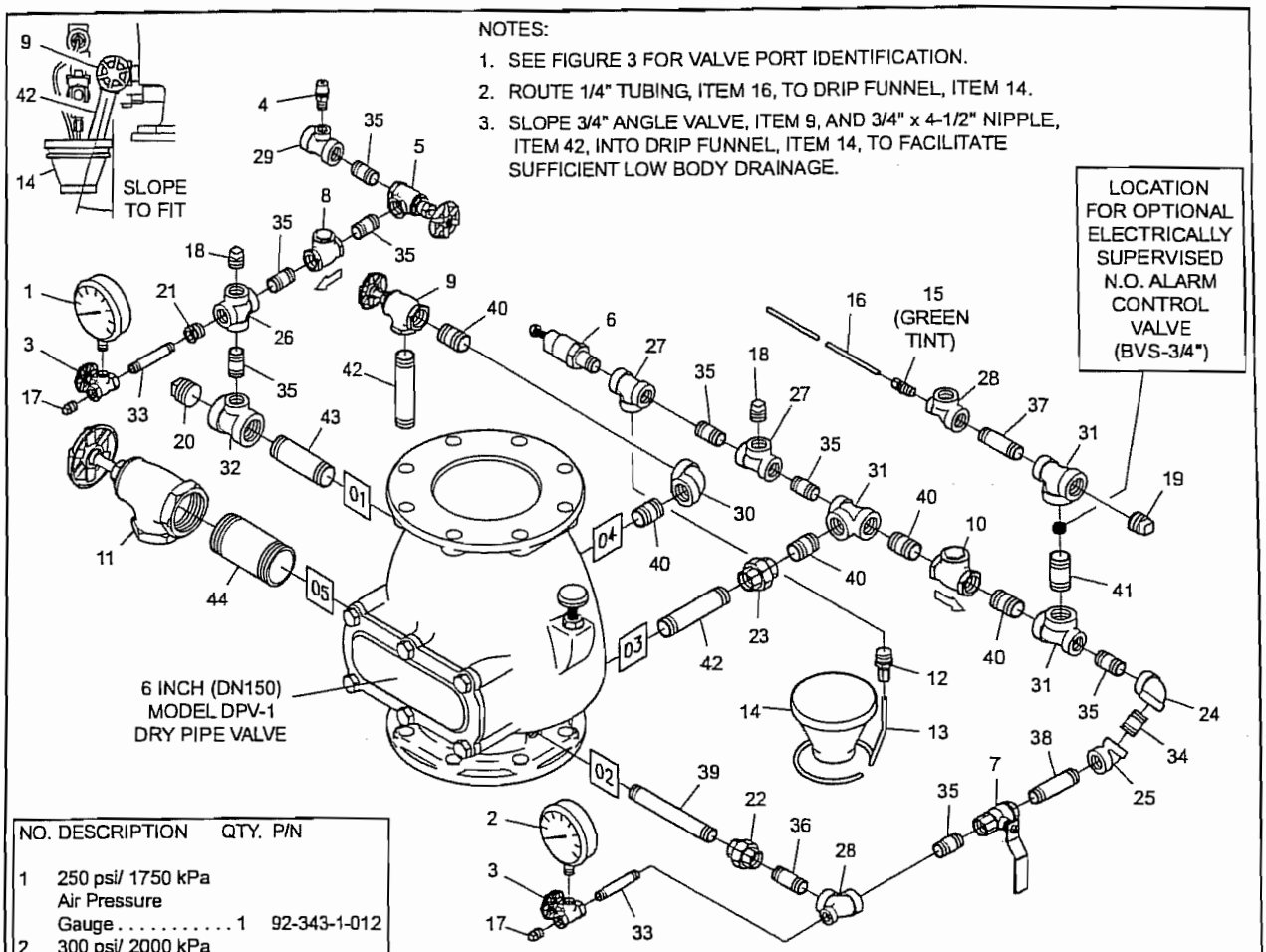


FIGURE 5 — Part 2 of 2
4 INCH (DN100) MODEL DPV-1 DRY PIPE VALVES
— ASSEMBLY PROCEDURE FOR VALVE TRIM —



NO.	DESCRIPTION	QTY.	P/N
1	250 psi/ 1750 kPa Air Pressure Gauge	1	92-343-1-012
2	300 psi/ 2000 kPa Water Pressure Gauge	1	92-343-1-005
3	1/4" Gauge Test Valve	2	46-005-1-002
4	1/4" Pressure Relief Valve	1	92-343-1-020
5	1/2" Angle Valve	1	46-048-1-004
6	Model AD-1 Automatic Drain Valve	1	52-793-2-004
7	1/2" Ball Valve	1	46-050-1-004
8	1/2" Swing Check Valve	1	46-049-1-004
9	3/4" Angle Valve	1	46-048-1-005
10	3/4" Swing Check Valve	1	46-049-1-005
11	2" Angle Valve	1	46-048-1-009
12	Drip Funnel Connector	1	92-211-1-005
13	Drip Funnel Bracket	1	92-211-1-003
14	Drip Funnel	1	92-343-1-007
15	3/32" Vent Fitting	1	92-032-1-002
16	1/4" Tube, 24" Long	1	CH

NO.	DESCRIPTION	QTY.	P/N
17	1/4" Plug	2	CH
18	1/2" Plug	2	CH
19	3/4" Plug	1	CH
20	1" Plug	1	CH
21	1/2" x 1/4" Reducing Bushing	1	CH
22	1/2" Union	1	CH
23	3/4" Union	1	CH
24	1/2" 90° Elbow	1	CH
25	1/2" 45° Elbow	1	CH
26	1/2" Cross	1	CH
27	1/2" Tee	2	CH
28	1/2" x 1/4" x 1/2" Reducing Tee	2	CH
29	1/2" x 1/2" x 1/4" Reducing Tee	1	CH
30	3/4" 90° Elbow	1	CH
31	3/4" x 1/2" x 3/4" Reducing Tee	3	CH
32	1" x 1" x 1/2" Reducing Tee	1	CH
33	1/4" x 3" Nipple	2	CH

NO.	DESCRIPTION	QTY.	P/N
34	1/2" x Close Nipple	1	CH
35	1/2" x 1-1/2" Nipple	8	CH
36	1/2" x 2" Nipple	1	CH
37	1/2" x 2-1/2" Nipple	1	CH
38	1/2" x 3" Nipple	1	CH
39	1/2" x 6" Nipple	1	CH
40	3/4" x 1-1/2" Nipple	5	CH
41	3/4" x 2" Nipple	1	CH
42	3/4" x 4-1/2" Nipple	2	CH
43	1" x 4" Nipple	1	CH
44	2" x 4-1/2" Nipple	1	CH

All Fittings and Nipples are Galvanized

CH: Common Hardware

FIGURE 6 — Part 1 of 2
6 INCH (DN150) MODEL DPV-1 DRY PIPE VALVES
— EXPLODED VIEW OF VALVE TRIM

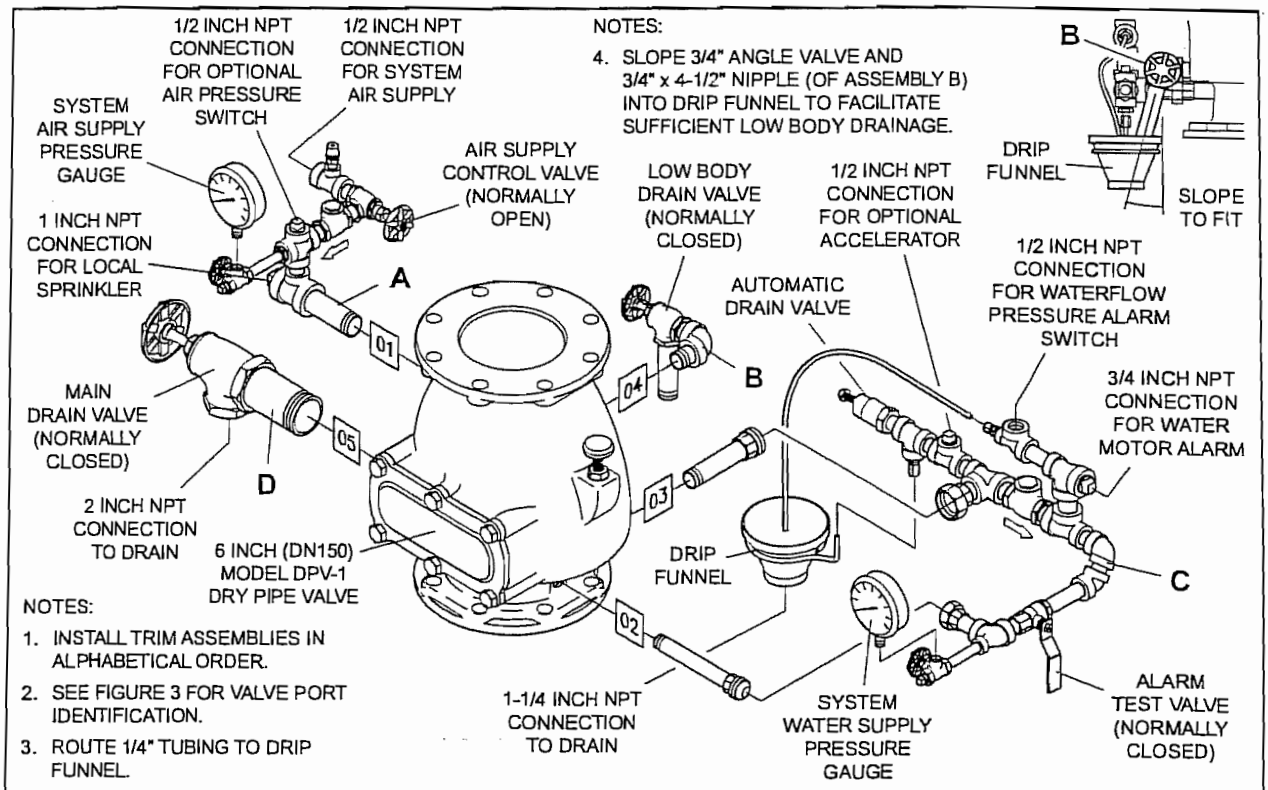


FIGURE 6 — Part 2 of 2
6 INCH (DN150) MODEL DPV-1 DRY PIPE VALVES
— ASSEMBLY PROCEDURE FOR VALVE TRIM —

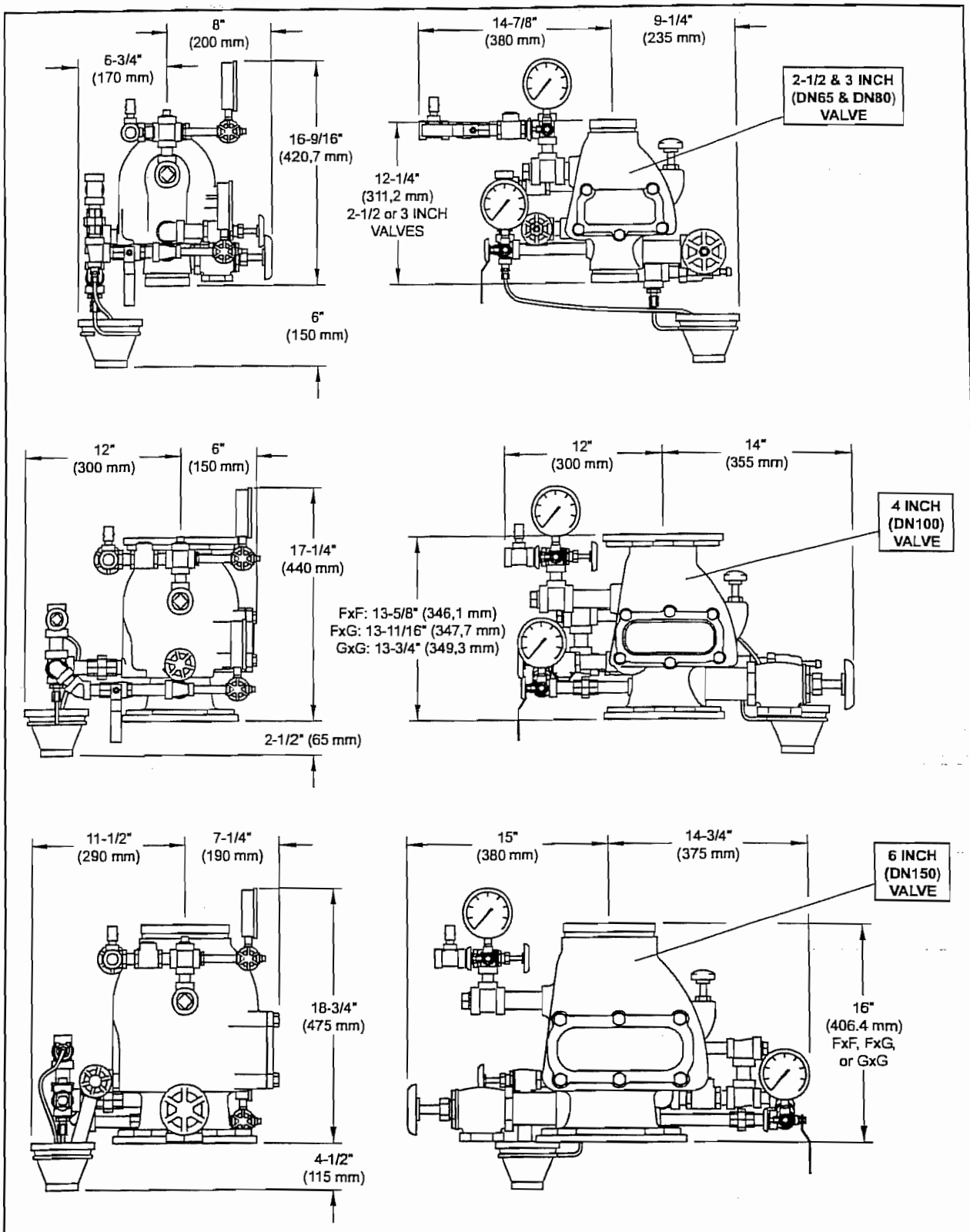


FIGURE 7
MODEL DPV-1 DRY PIPE VALVE
— INSTALLATION DIMENSIONS —

Installation

NOTES

Proper operation of the Model DPV-1 Dry Pipe Valve depends upon its trim being installed in accordance with the instructions given in this Technical Data Sheet. Failure to follow the appropriate trim diagram may prevent the DPV-1 Valve from functioning properly, as well as void listings, approvals, and the manufacturer's warranties.

Failure to latch open the Clapper Assembly prior to a system hydrostatic test may result in damage to the Clapper Assembly.

The DPV-1 Valve must be installed in a readily visible and accessible location.

The DPV-1 Valve and associated trim must be maintained at a minimum temperature of 40°F/4°C.

Heat tracing of the DPV-1 Valve or its associated trim is not permitted. Heat tracing can result in the formation of hardened mineral deposits that are capable of preventing proper operation.

The Model DPV-1 Dry Pipe Valve is to be installed in accordance with the following criteria:

Step 1. All nipples, fittings, and devices must be clean and free of scale and burrs before installation. Use pipe thread sealant sparingly on male pipe threads only.

Step 2. The DPV-1 Valve must be trimmed in accordance with Figures 4, 5, or 6, as applicable. If the DPV-1 is to be equipped with a Dry Pipe Valve Accelerator, refer to the Technical Data Sheet TFP1100 for the Model QRS Electronic Dry Pipe Valve Accelerator or TFP1112 for the Model ACC-1 Mechanical Dry Pipe Valve Accelerator.

Step 3. Care must be taken to make sure that check valves, strainers, globe valves, etc. are installed with the flow arrows in the proper direction.

Step 4. Drain tubing to the drip funnel must be installed with smooth bends that will not restrict flow.

Step 5. The main drain and drip funnel drain may be interconnected provided a check valve is located at least 12 inches (300 mm) below the drip funnel. The Low Body Drain Valve (Fig. 4, 5, or 6) may be piped so as to discharge into the Drip Funnel or to a separate drain.

Step 6. Suitable provision must be made for disposal of drain water. Drainage water must be directed such that it will not cause accidental damage to property or danger to persons.

Step 7. Unused pressure alarm switch and/or water motor alarm connections must be plugged.

Step 8. The Pressure Relief Valve provided with the Valve Trim is factory set to relieve at a pressure of approximately 45 psi (3,1 bar), which can typically be used for a maximum normal system air pressure of 40 psi (2,8 bar). The Pressure Relief Valve may be reset to a lower or higher pressure; however, it must be be reset to relieve at a pressure which is in accordance with the requirements of the Authority Having Jurisdiction.

To reset the Pressure Relief Valve, first loosen the jam nut and then adjust the cap accordingly — clockwise for a higher pressure setting or counterclockwise for a lower pressure setting. After verifying the desired pressure setting, tighten the jam nut.

Step 9. Installation of an Air Maintenance Device, as described in the Technical Data Section, is recommended.

Step 10. An Inspector's Test Connection as required By NFPA 13 must be provided on the system piping at the most remote location from the Model DPV-1 Valve.

Step 11. Conduit and electrical connections are to be made in accordance with the requirements of the authority having jurisdiction and/or the National Electric Code.

Step 12. Before a system hydrostatic test is performed in accordance with NFPA 13 system acceptance test requirements, the Clapper Assembly is to be manually latched open (Ref. Fig. 3D); the Automatic Drain Valve (Fig. 4, 5, or 6) is to be temporarily replaced with a 1/2 inch NPT plug, the 3/32 inch Vent Fitting (Item 13, Fig. 4; Item 15, Fig. 5; or Item 15, Fig. 6) is to be temporarily replaced with a 1/4 inch NPT plug, and the Handhole Cover Bolts are to be tightened using a cross-draw sequence.

Valve Setting Procedure

Steps 1 through 11 are to be performed when initially setting the Model DPV-1 Dry Pipe Valve; after an operational test of the fire protection system; or, after system operation due to a fire.

NOTES

If the DPV-1 is equipped with a Dry Pipe Valve Accelerator, refer to its resetting instructions before resetting the DPV-1. Refer to TFP1100 for the QRS or TFP1112 for the ACC-1.

Based on the instructions provided, reset the Accelerator at the appropriate time during the resetting of the DPV-1.

Step 1. Close the Main Control Valve, and close the Air Supply Control Valve (Fig. 4, 5, or 6). If the DPV-1 is equipped with a Dry Pipe Valve Accelerator, remove the Dry Pipe Valve Accelerator from service in accordance with its Technical Data Sheet (Refer to TFP1100 for the QRS or TFP1112 for the ACC-1).

Step 2. Open the Main Drain Valve (Fig. 4, 5, or 6) and all auxiliary drains in the system. Close the auxiliary drain valves after water ceases to discharge. Leave the Main Drain Valve open.

Step 3. Depress the plunger of the Automatic Drain Valve (Fig. 4, 5, or 6) to verify that it is open and that the DPV-1 Valve is completely drained.

Step 4. Open the Optional Alarm Control Valve (Fig. 4, 5, or 6), as applicable, if it was closed to silence local alarms.

Step 5. As necessary, replace all sprinklers that have operated. Replacement sprinklers must be of the same type and temperature rating as those which have operated.

NOTE

In order to prevent the possibility of a subsequent operation of an overheated solder type sprinkler, any solder type sprinklers which were possibly exposed to a temperature greater than their maximum rated ambient must be replaced.

Step 6. Push down on the Reset Knob (Fig. 3E) to allow the Clapper Assembly to reseat.

Step 7. Pressurize the system with air (or nitrogen) to 10 psi (0,7 bar), and then individually open all auxiliary drain valves in the system piping to drain any remaining water in trapped sections. Close each drain valve as soon as water ceases to discharge.

Also partially open the Low Body Drain Valve (Fig. 4, 5, or 6) to assure that the riser is completely drained. Close the Low Body Drain Valve as soon as water ceases to discharge.

Step 8. Refer to Table B and then restore the system to the normal system air pressure as necessary to hold the DPV-1 Valve closed.

Step 9. Depress the plunger on the Automatic Drain Valve to make sure it is open and that there is no air discharging.

The absence of air discharging from the Automatic Drain Valve is an indication of a properly set air seat within the DPV-1 Valve. If air is discharging, refer to the Care and Maintenance section under Automatic Drain Valve Inspection to determine/correct the cause of the leakage problem.

Step 10. Partially open the Main Control Valve. Slowly close the Main Drain Valve as soon as water discharges from the drain connection.

Depress the plunger on the Automatic Drain Valve to make sure that it is open and that there is no water discharging. The absence of water discharging from the Automatic Drain Valve is an indication of a properly set water seat within the DPV-1 Valve. If water is discharging, refer to the Care and Maintenance section under the Automatic Drain Valve Inspection to determine/correct the cause of the leakage problem.

If there are no leaks, the DPV-1 Valve is ready to be placed in service and the Main Control Valve must then be fully opened.

NOTE

After setting a fire protection system, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.

Step 11. Once a week after a valve is reset following an operational test or system operation, the Low Body Drain Valve (and any low point drain valves) should be partially opened (and then subsequently closed) to relieve drain-back water. Continue this procedure until drain-back water is no longer present.

Care and Maintenance

The following procedures and inspections should be performed as indicated, in addition to any specific requirements of the NFPA, and any impairment must be immediately corrected.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. The installing contractor or product manufacturer should be contacted relative to any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service.

NOTES

The operational test procedure and waterflow pressure alarm test procedure will result in operation of the associated alarms. Consequently, notification must first be given to the owner and the fire department, central station, or other signal station to which the alarms are connected.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection systems must first be obtained from the proper authorities and all personnel who may be affected by this decision must be notified.

Annual Operation Test Procedure

Proper operation of the DPV-1 Valve (i.e., opening of the DPV-1 Valve during a fire condition) should be verified at least once a year as follows:

Step 1. If water must be prevented from flowing beyond the riser, perform the following steps.

- Close the Main Control Valve.
- Open the Main Drain Valve.
- Open the Main Control Valve one turn beyond the position at which water just begins to flow from the Main Drain Valve.
- Close the Main Drain Valve.

Step 2. Open the system's Inspector's Test Connection.

Step 3. Verify that the DPV-1 Valve has operated, as indicated by the flow of water into the system and that all waterflow alarms operate properly.

Step 4. Close the system's Main Control Valve.

Step 5. Reset the DPV-1 Valve in accordance with the Valve Setting Procedure.

NOTE

It is recommended that the requirement of NFPA 25 to annually inspect the inside of the valve be performed at this time and prior to resetting the DPV-1 Valve. Refer to the Automatic Drain Valve Inspection sub-section Steps 2 through 5 for instructions with regard to the inspection of the Clapper Facing.

Quarterly Waterflow Alarm Test Procedure

Testing of the system waterflow alarms should be performed quarterly. To test the waterflow alarm, open the Alarm Test Valve, which will allow a flow of water to the Waterflow Pressure Alarm Switch and/or Water Motor Alarm. Upon satisfactory completion of the test, close the Alarm Test Valve.

Water Pressure Inspection

The Water Pressure Gauge is to be inspected monthly (per NFPA 25) to ensure that normal system water pressure is being maintained.

Air Pressure Inspection

The Air Pressure Gauge is to be inspected monthly (per NFPA 25) to ensure that normal system air pressure is being maintained.

Automatic Drain Valve Inspection

The Automatic Drain Valve should be inspected monthly (per NFPA 25) by depressing the plunger and checking to ensure that the Automatic Drain Valve is not discharging water and/or air. A discharge of water and/or air is an indication that the air and/or water seats are leaking, which could subsequently cause a false operation should the intermediate chamber become inadvertently pressurized.

If leakage is present, take the DPV-1 Valve out of service (i.e., close the main control valve, open the main drain valve, close the air supply control valve, remove the Dry Pipe Valve Accelerator from service, as applicable, in accordance with its Technical Data Sheet (Refer to TFP1100 for the QRS or TFP1112 for the ACC-1), and open the Inspector's Test Connection to relieve the system air pressure to 0 psig as indicated on the System Air Pressure Gauge), and then after removing

the Handhole Cover, perform the following steps:

Step 1. Make sure that the Seat Ring is clean and free of any nicks or significant scratches.

Step 2. Remove the Clapper Assembly from the valve by first pulling out the Hinge Pin.

Step 3. Disassemble the Clapper Facing Retainer from the Clapper so that the Clapper Facing can be removed and inspected. Make sure that the Clapper Facing does not show signs of compression set, damage, etc. Replace the Clapper Facing if there is any signs of wear.

Step 4. Clean the Clapper Facing, Clapper, and Clapper Facing Retainer, and then reassemble the Clapper Assembly.

Step 5. Reinstall the Clapper Assembly with its Hinge Pin and then reinstall the Handhole Cover.

Limited Warranty

Products manufactured by Tyco Fire & Building Products (TFBP) are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by TFBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by TFBP to be defective shall be either repaired or replaced, at TFBP's sole option. TFBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFBP was informed about the possibility of such damages, and in no event shall TFBP's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

Ordering Procedure

NOTE

Refer to Table A for Flange Drilling Specifications.

Part Numbers for factory pre-trimmed Model DPV-1 Valves are provided in the Price Book.

Standard DPV-1 Dry Pipe Valve (American Standard Flange Drilling, Threaded Ports, and Groove Outside Diameter, as applicable):
Specify: (specify size) Model DPV-1 Dry Pipe Valve with (specify inlet x outlet) end connections, P/N (specify).

2-1/2 Inch (DN65)

G x G,
2.88 inch (73,1 mm) O.D. Groove x 2.88 inch (73,1 mm) O.D. Groove ..... P/N 52-310-1-925

3 Inch (DN80)

G x G,
3.50 inch (88,9 mm) O.D. Groove x 3.50 inch (88,9 mm) O.D. Groove ..... P/N 52-310-1-930

4 Inch (DN100)

G x G,
4.50 inch (114,3 mm) O.D. Groove x 4.50 inch (114,3 mm) O.D. Groove ..... P/N 52-310-1-940

F x G,
ANSI Drilled Flange x 4.50 inch (114,3 mm) O.D. Groove ..... P/N 52-310-1-440

F x F,
ANSI Drilled Flange x ANSI Drilled Flanged ..... P/N 52-310-1-040

6 Inch (DN150)

G x G,
6.62 inch (168,3 mm) O.D. Groove x 6.62 inch (168,3 mm) O.D. Groove ..... P/N 52-310-1-960

F x G,
ANSI Drilled Flange x 6.62 inch (168,3 mm) O.D. Groove ..... P/N 52-310-1-460

F x F,
ANSI Drilled Flange x ANSI Drilled Flanged ..... P/N 52-310-1-060

Standard Galvanized DPV-1 Trim (Ref. Figure F):
Specify: 2-1/2 and 3 Inch DPV-1 Semi-Preassembled Galvanized Trim, P/N 52-309-2-005.

Specify: 4 Inch DPV-1 Semi-Preassembled Galvanized Trim, P/N 52-309-2-001.

Specify: 6 Inch DPV-1 Semi-Preassembled Galvanized Trim, P/N 52-309-2-002.

Optional Accelerator:

Model QRS Electronic Accelerator (Details provided in TFP1100)

Specify: Model QRS Electronic Dry Pipe Valve Accelerator Package, P/N 52-312-2-101.

Model ACC-1 Mechanical Accelerator (Details provided in TFP1112)

Specify: Model ACC-1 Dry Pipe Accelerator, P/N 52-311-1-001, and

Galvanized Accelerator Trim for Model DPV-1 Dry Pipe Valve, P/N 52-311-2-010.

Optional 600 PSI Water Pressure Gauge:

Specify: 600 PSI Water Pressure Gauge, P/N 92-343-1-004.

Accessories:
Order the Technical Data Sheets for the following, as applicable, for details and additional accessories:

Model PS10-2A
Potter Electric Waterflow Pressure Alarm Switch ..... P/N 54-281-1-002

Model WMA1
Water Motor Alarm ..... P/N 52-630-1-001

Model AMD-1
Air Maintenance Device ..... P/N 52-324-2-002

Model AMD-2
Air Maintenance Device ..... P/N 52-326-2-001

Model AMD-3
Nitrogen Maintenance Device ..... P/N 52-328-2-001

Replacement Valve Parts:
Specify: (description) for use with (specify size) Model DPV-1 Dry Pipe Valve, P/N (see Figure 1A and 1B).

Replacement Trim Parts :
Specify: (description) for use with (specify size) Model DPV-1 Dry Pipe Valve, P/N (see Figure 4, 5, or 6, as applicable).

Weights:
The following are the nominal weights for the valves and trim:

2-1/2 Inch (DN65)
Model DPV-1
G x G Dry Pipe Valve ..... 37 lbs. (17 kg)

3 Inch (DN80)
Model DPV-1
G x G Dry Pipe Valve ..... 38 lbs. (18 kg)

2-1/2 & 3 Inch (DN65/80) Valve Trim ..... 23 lbs. (11 kg)

4 Inch (DN100)
Model DPV-1
G x G Dry Pipe Valve ..... 57 lbs. (26 kg)

4 Inch (DN100)
Model DPV-1
F x G Dry Pipe Valve ..... 67 lbs. (31 kg)

4 Inch (DN100)
Model DPV-1
F x F Dry Pipe Valve ..... 77 lbs. (36 kg)

4 Inch (DN100) Valve Trim ..... 30 lbs. (14 kg)

6 Inch (DN150)
Model DPV-1
G x G Dry Pipe Valve ..... 95 lbs. (44 kg)

6 Inch (DN150)
Model DPV-1
F x G Dry Pipe Valve ..... 108 lbs. (50 kg)

6 Inch (DN150)
Model DPV-1
F x F Dry Pipe Valve ..... 121 lbs. (56 kg)

6 Inch (DN150) Valve Trim ..... 30 lbs. (14 kg)

Other DPV-1 Dry Pipe Valves:

NOTES

Other DPV-1 Dry Pipe Valves are valves ordered with a any combination of flange, threaded ports, or groove outside diameter not offered under "Standard DPV-1 Dry Pipe Valve" offerings.

Valves with NPT threaded ports are intended for use with the "Standard Galvanized DPV-1 Valve Trim" offered and detailed in this document. Valves with ISO threaded ports are intended for use with special order trim that is provided by local distributors to meet the specific needs of certain localities. Please contact your local distributor regarding valves and valve trim for specific localities.

Specify: (specify size) Model DPV-1 Dry Pipe Valve with (specify inlet x outlet) connections with (specify NPT or ISO) threaded ports, P/N (specify).

Part Numbers For Other 2-1/2 Inch (DN65) Dry Pipe Valves:

Valves with NPT Ports

G x G,
3.00"(76,1 mm) Outside Dia. Groove x 3.00"(76,1 mm) Outside Dia. Groove ..... P/N 52-309-1-930

Valves with ISO Ports

G x G,
2.88"(73,0 mm) Outside Dia. Groove x 2.88"(73,0 mm) Outside Dia. Groove ..... P/N 52-309-1-920

G x G,
3.00"(76,1 mm) Outside Dia. Groove x 3.00"(76,1 mm) Outside Dia. Groove ..... P/N 52-309-1-940

Part Numbers For Other 3 Inch (DN80) Dry Pipe Valves:

Valves with ISO Ports

G x G,
3.50"(88,9 mm) Outside Dia. Groove x 3.50"(88,9 mm) Outside Dia. Groove ..... P/N 52-309-1-922

Part Numbers For Other 4 Inch (DN100) Dry Pipe Valves:

Valves with NPT Ports

F x G,
ISO Flange x 4.50"(114,3 mm) Outside Dia. Groove ..... P/N 52-309-1-253

F x G,
AS Flange x 4.50"(114,3 mm) Outside Dia. Groove ..... P/N 52-309-1-613

F x G,
JIS Flange x 4.50"(114,3 mm) Outside Dia. Groove ..... P/N 52-309-1-813

F x F,
ISO Flange x ISO Flange ..... P/N 52-309-1-133

F x F,
AS Flange x AS Flange ..... P/N 52-309-1-513

F x F,
JIS Flange x JIS Flange ..... P/N 52-309-1-713

Valves with ISO Ports

G x G,
4.50"(114,3 mm) Outside Dia. Groove x 4.50"(114,3 mm) Outside Dia. Groove ..... P/N 52-309-1-923

F x G,
ISO Flange x 4.50"(114,3 mm) Outside Dia. Groove ..... P/N 52-309-1-213

F x F,
ISO Flange x ISO Flange ..... P/N 52-309-1-113

Part Numbers For Other 6 Inch (DN150) Dry Pipe Valves:

Valves with NPT Ports

G x G,
6.50"(165,1 mm) Outside Dia. Groove x 6.50"(165,1 mm) Outside Dia. Groove ..... P/N 52-309-1-935

F x G,
ANSI Flange x 6.50"(165,1 mm) Outside Dia. Groove ..... P/N 52-309-1-435

F x G,
ISO Flange x 6.62"(168,3 mm) Outside Dia. Groove ..... P/N 52-309-1-255

F x G,
ISO Flange x 6.50"(165,1 mm) Outside Dia. Groove ..... P/N 52-309-1-335

F x G,
AS Flange x 6.62"(168,3 mm) Outside Dia. Groove ..... P/N 52-309-1-615

F x G,
AS Flange x 6.50"(165,1 mm) Outside Dia. Groove ..... P/N 52-309-1-635

F x G,
JIS Flange x 6.62"(168,3 mm) Outside Dia. Groove ..... P/N 52-309-1-815

F x G,
JIS Flange x 6.50"(165,1 mm) Outside Dia. Groove ..... P/N 52-309-1-835

F x F,
ISO Flange x ISO Flange ..... P/N 52-309-1-135

F x F,
AS Flange x AS Flange ..... P/N 52-309-1-515

F x F,
JIS Flange x JIS Flange ..... P/N 52-309-1-715

Valves with ISO Ports

G x G,
6.62"(168,3 mm) Outside Dia. Groove x 6.62"(168,3 mm) Outside Dia. Groove ..... P/N 52-309-1-925

G x G,
6.50"(165,1 mm) Outside Dia. Groove x 6.50"(165,1 mm) Outside Dia. Groove ..... P/N 52-309-1-945

F x G,
ISO Flange x 6.62"(168,3 mm) Outside Dia. Groove ..... P/N 52-309-1-215

F x G,
ISO Flange x 6.50"(165,1 mm) Outside Dia. Groove ..... P/N 52-309-1-315

F x F,
ISO Flange x ISO Flange ..... P/N 52-309-1-115

300 lb. WWP UL/FM Butterfly Valves

Fire Protection Valve • Grooved Mechanical Style • Nylon Coated Ductile Iron Body • Extended Neck • Elastomer Encapsulated Disc • Accepts Internal and External Supervisory Switches

300 PSI/20.7 Bar Non-Shock Cold Water 2½" - 8"
175 PSI/12.1 Bar Non-Shock Cold Water 10"

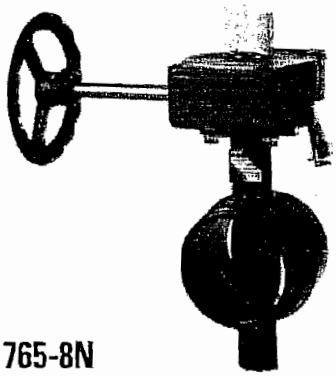
UL/ULC LISTED • FMRC APPROVED • 2½" - 10" UL LISTED FOR INDOOR AND OUTDOOR SERVICE • CALIFORNIA STATE FIRE MARSHALL APPROVAL NO. 7770-1243:101 • APPROVED BY THE NEW YORK CITY MEA 9-97-E, VOL.2 WHEN ASSEMBLED WITH APPROPRIATE NYC INDICATOR FLAG

MATERIAL LIST

	PART	SPECIFICATION
1.	Upper Stem	Stainless Steel ASTM A 582 Type 416
2.	Upper Bushing	PTFE Bronze Sintered on Steel
3.	"O" Ring	Buna-N
4.	Body	Ductile Iron ASTM A 395 with Polymide Coating
5.	Disc	Ductile Iron ASTM A 395 with EPDM Encapsulation
6.	Lower Bushing	PTFE Bronze Sintered on Steel
7.	Lower Stem	Stainless Steel ASTM A 582 Type 416
8.	Dust Plug	PVC
9.	Nameplate	Aluminum
10.	Gear Operator	Cast Iron and Steel
11.	Indicator Flag	Cast Iron
12.	Handwheel	Cast Iron

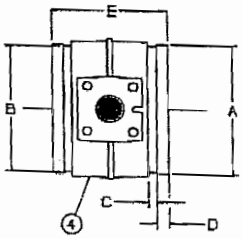
***-8N version has two factory mounted internal supervisory switches.**
-4N version is gear operated only

Uses NIBCO model #TS-4 Switch Kit.
Polymide coating has NSF certification.



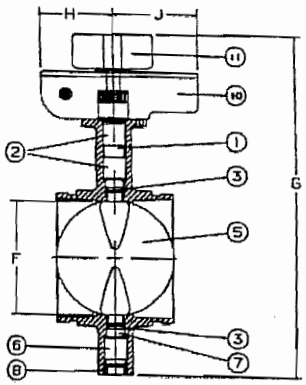
GD-1765-8N
10"
(not shown)

GD-4765-8N*
Grooved
2½" thru 8"

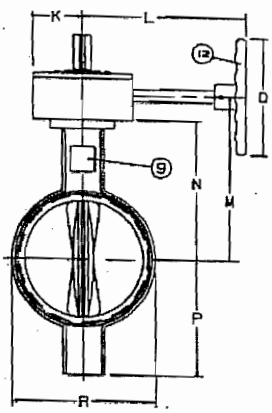


DIMENSIONS—WEIGHTS—QUANTITIES

Size		Dimensions A		B		C		D		E		F		G		H	
In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.
2½	65	2.88	73	2.72	69	0.31	8	0.63	16	3.85	98	2.42	61	11.94	303	2.91	74
3 O.D.	76.1	3.00	76	2.84	72	0.31	8	0.63	16	3.85	98	2.42	61	11.94	303	2.91	74
3	80	3.50	89	3.34	85	0.31	8	0.63	16	3.85	98	2.86	73	12.48	317	2.91	74
4	100	4.50	114	4.33	110	0.38	10	0.63	16	4.56	116	3.84	98	14.18	360	2.91	74
5	125	5.56	141	5.39	137	0.38	10	0.63	16	5.86	149	4.79	122	15.17	385	2.91	74
6	150	6.63	168	6.45	164	0.38	10	0.63	16	5.86	149	5.73	146	17.54	446	2.91	74
6 O.D.	165.1	6.51	165	6.32	161	0.38	10	0.63	16	5.86	149	5.73	146	17.54	446	2.91	74
8	200	8.63	219	8.44	214	0.44	11	0.75	19	5.26	134	7.71	196	19.42	493	2.91	74
10	250	10.75	273	10.56	268	0.50	13	0.75	19	6.29	160	9.56	243	24.03	610	3.90	99



Size		Dimensions J		K		L		M		N		P		Q		R		Weight	
In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	Lbs.	Kg.
2½	65	3.54	90	2.13	54	5.82	148	5.67	144	4.19	106	3.25	83	5.9	150	3.46	88	22	10.0
3 O.D.	76.1	3.54	90	2.13	54	5.82	148	5.67	144	4.19	106	3.25	83	5.9	150	3.46	88	22	10.4
3	80	3.54	90	2.13	54	5.82	148	5.94	151	4.44	113	3.54	90	5.9	150	3.97	101	23	10.4
4	100	3.54	90	2.13	54	7.64	194	6.31	173	5.33	135	4.35	110	5.9	150	5.03	128	28	12.7
5	125	3.54	90	2.13	54	7.64	194	7.32	186	5.83	148	4.84	123	5.9	150	6.27	159	31	14.1
6	150	3.54	90	2.13	54	7.64	194	8.62	219	7.11	181	5.93	151	5.9	150	7.25	184	41	18.6
6 O.D.	165.1	3.54	90	2.13	54	7.64	194	8.62	219	7.11	181	5.93	151	5.9	150	7.25	184	41	18.6
8	200	3.54	90	2.13	54	7.91	201	9.80	249	8.05	204	6.87	174	9.8	250	9.25	235	53	24.1
10	250	3.98	101	3.03	77	9.49	241	11.61	295	9.86	250	9.17	233	11.8	300	11.25	286	88	40.0



FM APPROVED

FIGURE 513, 513D/513R—RISER MANIFOLD

The Figure 513, 513D/513R Riser Manifold provides all of the accessory equipment for a riser in a single assembly. The availability of the Riser Manifold in different configurations allows cost effective riser installations in commercial (NFPA 13) systems, high rise buildings requiring floor control assemblies, and residential systems (NFPA 13D/13R).

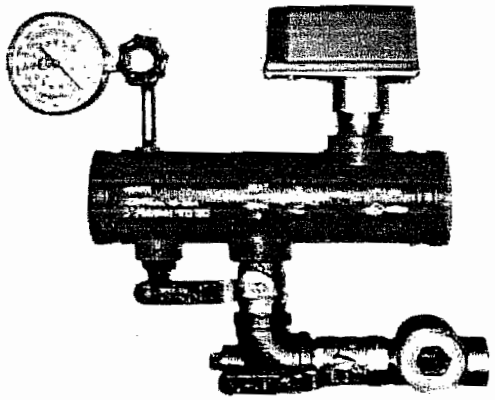
The threaded ends of the 1" and 1½" bodies, the threaded by grooved ends of the 2" bodies, and the grooved ends of the 1½" - 6" bodies allow for an easy transition to either check or control valves. The exclusive and dedicated flow switch designed for the manifolds has been tested and Listed for use in this specific configuration by Underwriters Laboratories, Underwriters Laboratories of Canada and Factory Mutual.

Installation is simplified with one convenient take-out for the 1" and 1½" threaded and 1½" grooved versions, as well as one take-out for the 2" threaded by grooved and the grooved sizes 2" - 6".

The Riser Manifold is approved for installation in either the horizontal or the vertical position. The optional relief valve assembly is available for locations that require this feature.

Riser Manifolds for use in Canada are provided with a Water Flow Switch that has a Tamper Switch mounted inside for cover removal detection.

Refer to general notes on page 8.



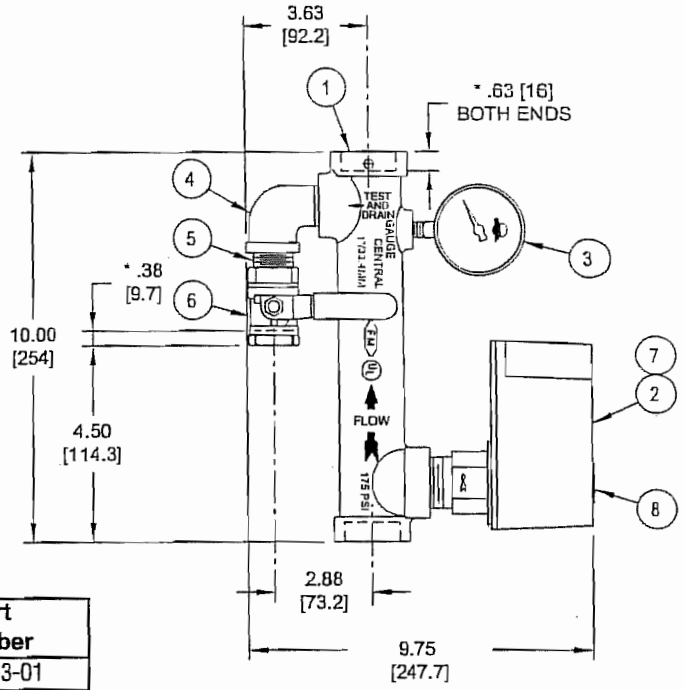
See Fire Protection Submittal Sheet for pressure rating and Listing and Approval information.

Figure 513D
1" Threaded Residential Riser Manifold

Approximate Trimmed Weight - 7.5 lbs. (3.4Kg.)

The width of the Riser Manifold is approximately 3½".

Note: Items 7 & 8 are used on Manifolds for use in Canada Only



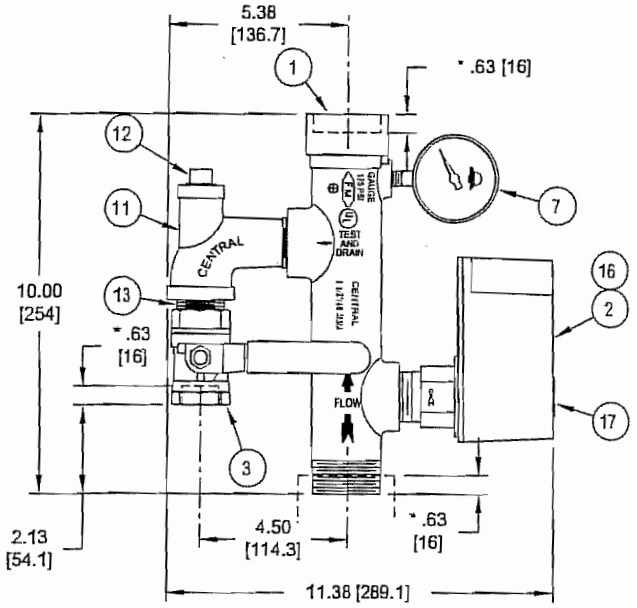
*Approximate thread engagement.
Note: Values shown in parenthesis are in millimeters

1" Threaded Residential Riser Manifold

Detail No.	Description	Part Number
1	Manifold Body F x F	976-363-01
2	Potter Waterflow Switch # VSR-SF w/Paddle	H-416-01
3	¼" Water Pressure Gauge	971-118-02
4	¾" 90° Street Elbow	H-463-075
5	¾" Close Nipple	H-474-12
6	¾" Ball Valve	971-116-02
7	Tamper Switch (ULC only)	H-419-01
8	Label (ULC only)	976-343-01

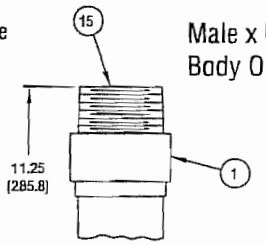
Riser Manifold — Figure 513, 513D/513R

Figure 513D/513R
1½" Threaded Residential Riser Manifold



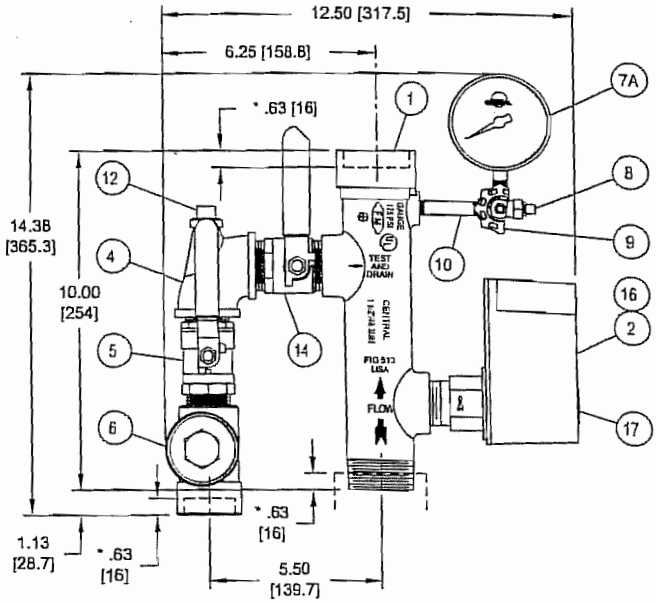
*Approximate thread engagement.
Note: Values shown in parenthesis are in millimeters

Approximate Trimmed Weight - 8.7 lbs. (3.9Kg.)
The width of the Riser Manifold is approximately 3½".
Note: Items 16 & 17 are used on Manifolds for use in Canada Only.



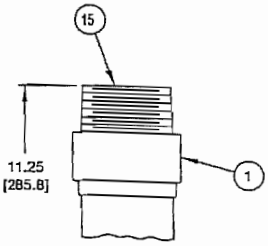
Male x Male Body Option

Figure 513
1½" Threaded Commercial Riser Manifold



*Approximate thread engagement.
Note: Values shown in parenthesis are in millimeters

Approximate Trimmed Weight - 11.2 lbs. (5.1Kg.)
The width of the Riser Manifold is approximately 3½".
Note:Items 16 & 17 are used on Manifolds for use in Canada Only.

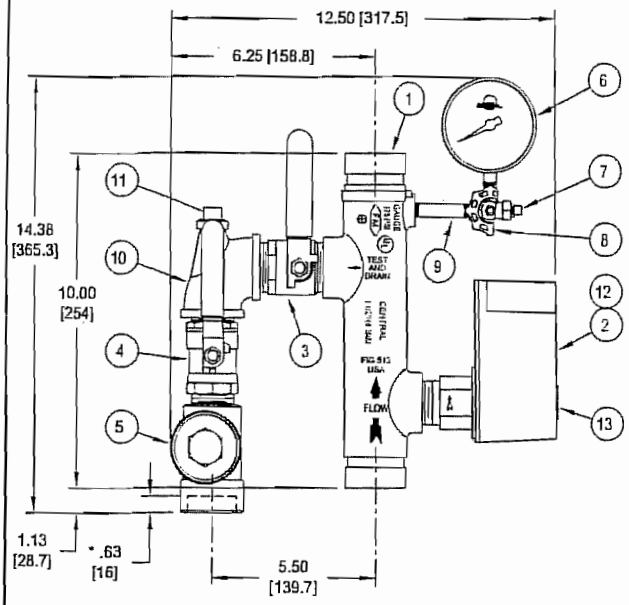


Male x Male Body Option

Figure 513 & 513D/513R
1½" Threaded Residential and Commercial Riser Manifold

Detail No.	Description	No. Req'd Com.	No. Req'd Res.	Part Number
1	Manifold Body M x F	1	1	976-339-01
2	Potter Waterflow Switch # VSR-SF w/ 1¼" Paddle	1	1	H-416-02
3	1" Ball Valve F101	0	1	971-116-03
4	1" x ½" x 1" Reducing Tee	1	0	H-469-100-050-100
5	1" Insp. Test & Drain Valve F202 w/½" Test Orifice	1	0	971-122-04
6	Sight Glass M x F	1	0	H-418-100
7	¼" Water Pressure Gauge	0	1	971-118-02
7a	¼" Water Pressure Gauge	1	0	971-118-01
8	¼" Pipe Plug	1	0	H450-025-000
9	¼" 3-Way Globe Valve	1	0	971-119-01
10	¼" x 3" Nipple	1	0	H-459-025-30
11	1" x ½" x 1" California Tee	0	1	976-385-01
12	½" Pipe Plug	1	1	H450-050-000
13	1" Close Nipple	0	1	H-474-16
14	1" Ball Valve	1	0	971-121-01
15	1½" Close Nipple	1	1	H-474-24
16	Tamper Switch (ULC only)	1	1	H-419-01
17	Label (ULC only)	1	1	976-343-01

Figure 513
1½" Grooved Commercial Riser Manifold



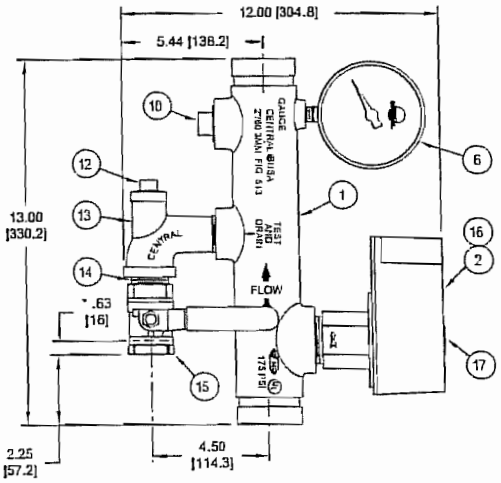
*Approximate thread engagement.
Note: Values shown in parenthesis are in millimeters

Approximate Trimmed Weight - 11.2 lbs. (5.1Kg.)
The width of the Riser Manifold is approximately 3½".
Note: Items 12 & 13 are used on Manifolds for use in Canada Only.

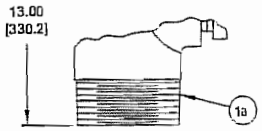
1½" Grooved Commercial Riser Manifold - Bill of Material

Detail No.	Description	Part Number
1	Manifold Body G x G	976-399-02
2	Potter Waterflow Switch #VSR-SF w/1¼" Paddle	H-416-02
3	1" Ball Valve F101	971-121-01
4	1" Insp. Test & Drain Valve F202 w/½" Test Orifice	971-122-04
5	Sight Glass M x F	H-418-100
6	¼" Water Pressure Gauge	971-118-01
7	¼" Pipe Plug	H-450-025-000
8	¼" 3-Way Globe Valve	971-119-01
9	¼" x 3" Nipple	H-459-025-30
10	1" x ½" x 1" Reducing Tee	H-469-100-050-100
11	½" Pipe Plug	H-450-050-000
12	Tamper Switch (ULC only)	H-419-01
13	Label (ULC only)	976-343-01

Figure 513D/513R
2" Grooved Residential Riser Manifold



*Approximate thread engagement.
Note: Values shown in parenthesis are in millimeters



2" Male x Groove Body Option

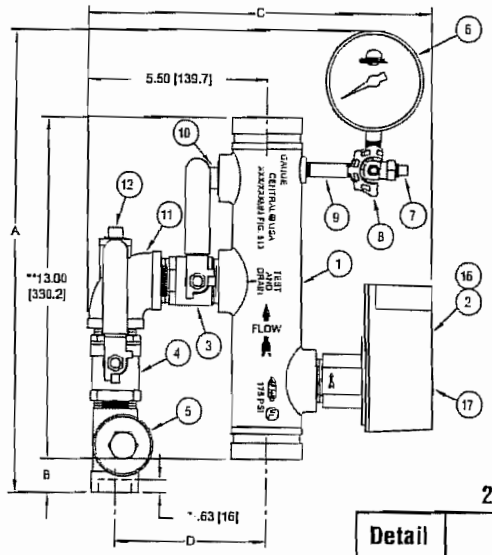
Approximate Trimmed Weight - 11.0 lbs. (5.0Kg.)
The width of the Riser Manifold is approximately 3½".

2" Grooved Residential Riser Manifold - Bill of Material

Detail No.	Description	Part Number
1	2" Manifold Body Groove x Groove	976-254-01
1a	2" Manifold Body Male x Groove	976-411-01
6	¼" Water Pressure Gauge	971-118-01
10	1" Pipe Plug	H-450-100-000
12	½" Pipe Plug	H-450-050-000
13	1" x ½" x 1" California Tee	976-385-01
14	1" Close Nipple	H-474-16
15	1" Ball Valve F101	971-116-03
16	Tamper Switch (ULC only)	H-419-01
17	Label (ULC only)	976-343-01

Note: Items 16 & 17 are used on Manifolds for use in Canada Only.

Figure 513
2", 2½", 3", 4" and 6" Grooved Commercial Riser Manifold



Approximate Weights and Dimensions of Trimmed
2", 2½", 3", 4", and 6" Grooved Commercial Riser Manifolds

Size Inches	A Inches *mm*	B Inches *mm*	C Inches *mm*	D Inches *mm*	Appx. Width Inches *mm*	Weight Lbs. *Kg.*
2	17.13 *135.0*	0.88 *22.2*	12.88 *327.0*	5.25 *139.7*	3.50 *88.9*	13.5 *6.1*
2½	18.13 *460.4*	1.88 *47.6*	13.75 *349.3*	6.38 *155.6*	3.50 *88.9*	16.8 *7.6*
3	18.13 *460.4*	1.88 *47.6*	14.38 *365.1*	6.25 *158.8*	3.50 *88.9*	18.7 *8.5*
4	20.00 *508.0*	3.75 *95.3*	17.38 *441.3*	8.38 *212.7*	4.50 *114.3*	32.7 *14.8*
6	20.00 *508.0*	3.75 *95.3*	19.25 *489.0*	9.25 *235.0*	6.63 *182.3*	41.6 *18.9*

* Approximate thread engagement.
** 13" is the take-out for all sizes 2" through 6"
Note: Values shown in parenthesis are in millimeters

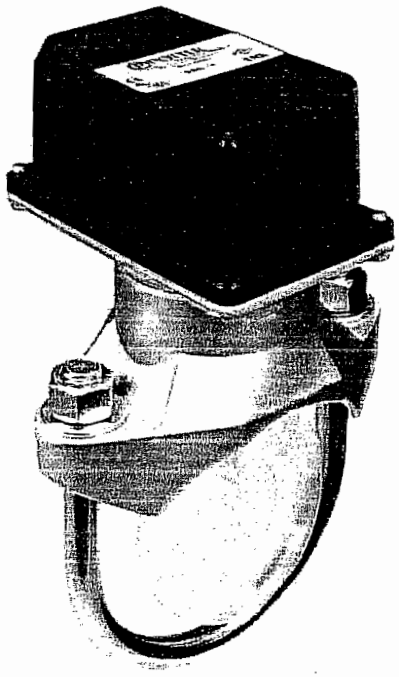
2", 2½", 3", 4", & 6" Grooved Commercial Riser Manifold - Bill of Material

Detail No.	Description	Part Number
1	2" Manifold Body Groove x Groove	976-254-01
	2½" Manifold Body Groove x Groove	976-254-02
	3" Manifold Body Groove x Groove	976-254-03
	4" Manifold Body Groove x Groove	976-254-04
	6" Manifold Body Groove x Groove	976-254-05
1a	2" Manifold Body Male x Groove	976-411-01
2	Potter Waterflow Switch # VSC w/ 2" Paddle	976-357-01
	Potter Waterflow Switch # VSC w/ 2½" Paddle	976-357-02
	Potter Waterflow Switch # VSC w/ 3" Paddle	976-357-03
	Potter Waterflow Switch # VSC w/ 4" Paddle	976-357-04
	Potter Waterflow Switch # VSC w/ 6" Paddle	976-357-05
3	1" Ball Valve F101 (2")	971-121-01
	1¼" Ball Valve F101 (2½" and 3")	971-121-02
	2" Ball Valve F101 (4" and 6")	971-121-03
4	1" Insp. Test & Drain Valve F202 (2") w/ ½" Test Orifice	971-122-04
	1¼" Insp. Test & Drain Valve F202 (2½" and 3") w/ ½" Test Orifice	971-122-05
	2" Insp. Test & Drain Valve F202 (4" and 6") w/ ½" Test Orifice	971-122-06
5	1" Sight Glass (2")	H-418-100
	1¼" Sight Glass (2½" and 3")	H-418-125
	2" Sight Glass (4" and 6")	H-418-200
6	¼" Water Pressure Gauge	971-118-01
7	¼" Pipe Plug	H-450-025-000
8	¼" 3-Way Globe Valve	971-119-01
9	¼" x 3" Nipple	H-459-025-30
10	1" Pipe Plug	H-450-100-000
11	1" x ½" x 1" Reducing Tee (2")	H-469-100-050-100
	1¼" x ½" x 1¼" Reducing Tee (2½" and 3")	H-469-125-050-125
	2" x ½" x 2" Reducing Tee (4" and 6")	H-469-200-050-200
12	½" Pipe Plug	H-450-050-000
13	1" x ½" x 1" California Tee	976-385-01
14	1" Close Nipple	H-474-16
15	1" Ball Valve F101	971-116-03
16	Tamper Switch (ULC only)	H-419-01
17	Label (ULC only)	976-343-01

Note: Items 16 & 17 are used on Manifolds for use in Canada Only.

POTTER
The Symbol of Protection

VSR-F
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD



U.S. Pat. No. 3921989
Canadian Pat. No. 1009680
Other Patents Pending
Potter Electric, Rd., 1990

UL, ULC and CSFM Listed, FM and LPCB Approved, NYMEA Accepted, CE Marked

Service Pressure: Up to 450 PSI (31 BAR)

Minimum Flow Rate for Alarm: 10 GPM (38 LPM)

Maximum Surge: 18 FPS (5,5 m/s)

Contact Ratings: Two sets of SPDT (Form C)
15.0 Amps at 125/250VAC
2.0 Amps at 30VDC Resistive

Conduit Entrances: Two knockouts provided for 1/2" conduit

Environmental Specifications:

- Suitable for indoor or outdoor use with factory installed gasket and die-cast housing.
- NEMA 4/IP54 Rated Enclosure - use with appropriate conduit fitting.
- Temperature Range: 40°F/120°F, 4,5°C/49°C
- Non-corrosive sleeve factory installed in saddle.

Caution: This device is not intended for applications in explosive environments.

Sizes Available: Steel Pipe schedules 10 thru 40, sizes 2" thru 8"
BS 1387 pipe 50mm thru 200mm
Note: For copper or plastic pipe use Model VSR-CF.

Service Use:

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

Optional: Cover Tamper Switch Kit, Stock No. 0090018

GENERAL INFORMATION

The Model VSR-F is a vane type waterflow switch for use on wet sprinkler systems. It is UL Listed and FM Approved for use on steel pipe; schedules 10 through 40, sizes 2" thru 8" (50mm thru 200mm).

LPC approved sizes are 2" thru 8" (50mm thru 200mm).

The unit may also be used as a sectional waterflow detector on large systems.

The unit contains two single pole, double throw, snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 gallons per minute (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

ENCLOSURE: The unit is enclosed in a general purpose, die-cast housing. The cover is held in place with two tamper resistant screws which require a special key for removal. A field installable cover tamper switch is available as an option which may be used to indicate unauthorized removal of the cover. See bulletin no. 5400775 for installation instructions of this switch.

INSTALLATION: See Fig.2

These devices may be mounted on horizontal or vertical pipe. On horizontal pipe they should be installed on the top side of the pipe where they will be accessible. The units should not be installed within 6" (15cm) of a fitting which changes the direction of the waterflow or within 24" (60 cm) of a valve or drain.

Drain the system and drill a hole in the pipe using a circular saw in a slow speed drill. The 2" (50mm) and 2 1/2" (65mm) devices require a hole with a diameter of 1 1/4" + 1/8" - 1/16" (33mm ±2mm). All other sizes require a hole with a diameter of 2" ±1/8" (50mm ±2mm).

Clean the inside pipe of all growth or other material for a distance equal to the pipe diameter on either side of the hole.

Roll the vane so that it may be inserted into the hole; do not bend or crease it. Insert the vane so that the arrow on the saddle points in the direction of the waterflow. Install the saddle strap and tighten nuts alternately to an eventual 50 ft-lbs. (68 n-m) of torque (see Fig. 2). The vane must not rub the inside of the pipe or bind in any way.

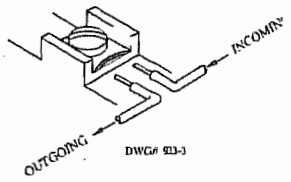
Specifications subject to change without notice.

POTTER
The Symbol of Protection

VSR-F
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

FIG. 1

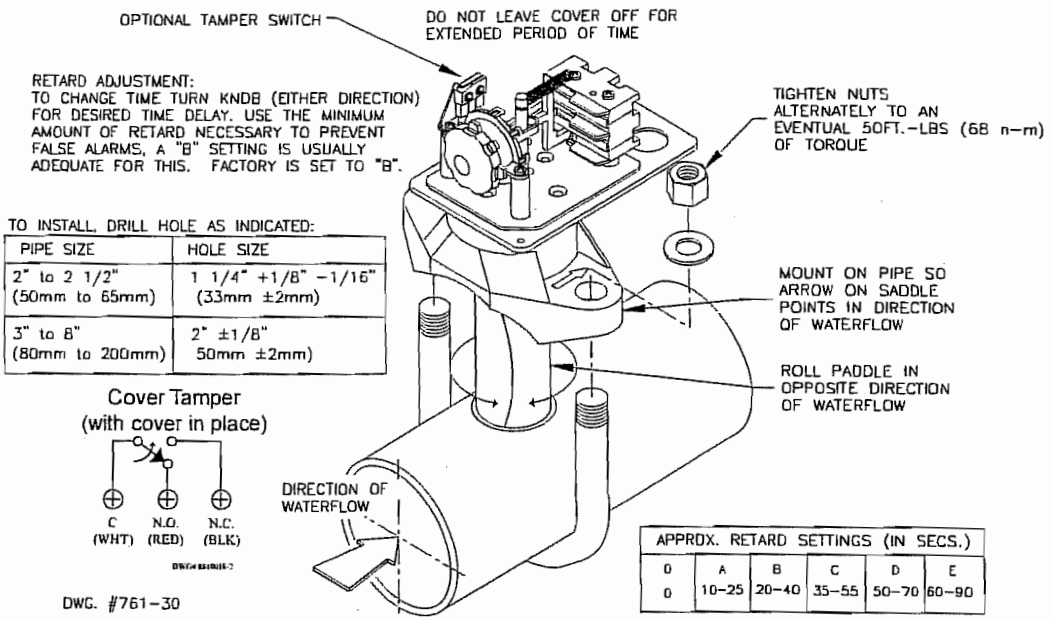
SWITCH TERMINAL CONNECTIONS CLAMPING PLATE TERMINAL



CAUTION:

An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire becomes dislodged from under the terminal.

FIG. 2



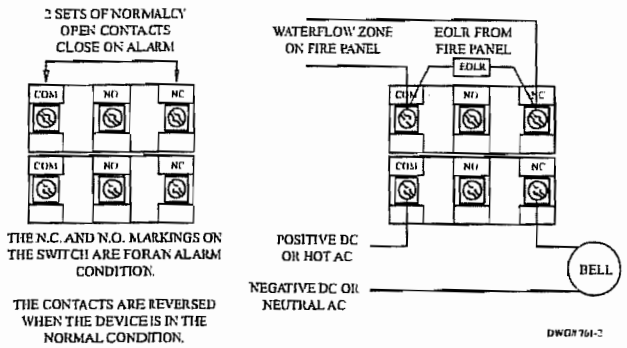
TO INSTALL, DRILL HOLE AS INDICATED:

PIPE SIZE	HOLE SIZE
2" to 2 1/2" (50mm to 65mm)	1 1/4" +1/8" -1/16" (33mm ±2mm)
3" to 8" (80mm to 200mm)	2" ±1/8" 50mm ±2mm)

DWG. #761-30

APPROX. RETARD SETTINGS (IN SECS.)					
0	A	B	C	D	E
0	10-25	20-40	35-55	50-70	60-90

FIG. 3 TYPICAL ELECTRICAL CONNECTIONS

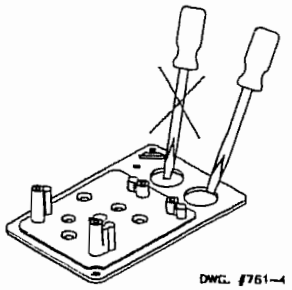


NOTES:

1. The Model VSR-F has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.
2. A condition of LPC Approval of this product is that the electrical entry must be sealed to exclude moisture.
3. For supervised circuits see "Switch Terminal Connections" drawing and caution note (Fig. 1).

FIG. 4

To remove knockouts: Place screwdriver at edge of knockouts, not in the center.



APPLICATION WARNING!

Due to the possibility of unintended discharges caused by pressure surges, trapped air, or short retard times, waterflow switches that are monitoring wet pipe sprinkler systems should not be used as the sole initiating device to discharge AFFF, deluge, or chemical suppression systems.

TESTING

The frequency of inspection and testing for the model VSR-F and its associated protective monitoring system should be in accordance with applicable NFPA Codes and Standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

If provided, the inspector's test valve, that is usually located at the end of the most remote branch line, should always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR-F is not recommended or advisable.

A minimum flow of 10 gpm (38 Lpm) is required to activate this device.

IMPORTANT NOTICE: Please advise the person responsible for testing of the fire protection system that this system must be tested in accordance with the testing instructions.

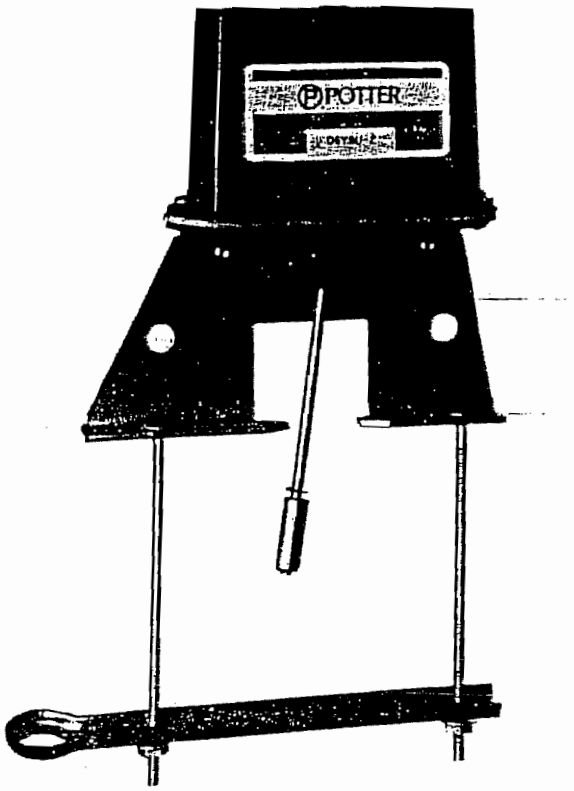
POTTER

OSYSU-1, -2

OUTSIDE SCREW AND YOKE VALVE SUPERVISORY SWITCH

Potter Electric Signal Company
2081 Craig Rd., / P.O. Box 28480
St. Louis, MO 63146-4161
(314) 878-4321 / (800) 325-3936

Potter Electric Signal & Mfg. LTD
1967 Leslie Street
Don Mills, Ontario, Canada M3B2M3
(416) 441-1833



OSYSU-1 STK. NO. 1010106
OSYSU-2 STK. NO. 1010206

UL & CSFM LISTED, FM, APPROVED, & NYMEA ACCEPTED

Dimensions: 6.19"L X 2.25"W X 5.88"H
15.7cm. L X 5.7cm. W X 14.6cm. H

Weight: 2 lbs. / .9 kg.

Enclosure: Cover - Die Cast Aluminum
Finish - Red Spatter Enamel
Base - Die Cast Zinc
All parts have corrosion resistant finishes

Cover Tamper: Tamper resistant screws,
Optional cover tamper kit available.

Contact Ratings: OSYSU-1—One set of S.P.D.T. (Form C)
OSYSU-2—Two sets of S.P.D.T. (Form C)
15.00A. @ 125/250VAC
2.50A @ 0-30VDC resistive

Environmental Limitations: -40°F to + 140°F (-40°C to 60°C)
NEMA 4 & NEMA 6P Enclosure.
Indoor or Outdoor Use (Not for use in hazardous locations, See Bulletin #5400705 OSYS-U-EX for hazardous locations).

Conduit Entrances: 2 knockouts for 1/2" conduit provided

Service Use:

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

GENERAL INFORMATION: The OSYSU is used to monitor the open position of an OS & Y (outside screw & yoke) type gate valve. This device is available in two models; the OSYSU-1, containing one set of S.P.D.T. (Form C) contacts and the OSYSU-2, containing two sets of S.P.D.T. (Form C) contacts. These switches mount conveniently to most OS & Y valves ranging in size from 2" to 12". They will mount on some valves as small as 1/2".

The cover is held in place by two tamper resistant screws that require a special tool to remove. The tool is furnished with each device and should be left with the building owner or responsible party. Replacement or additional cover screws and hex keys are available. See ordering information on page 4.

OPTIONAL COVER TAMPER SWITCH: A field installable cover tamper switch is available as an option which may be used to indicate removal of the cover. See ordering information on page 4.

TESTING: The OSYSU and its associated protective monitoring system should be inspected and tested in accordance with applicable NFPA codes and standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

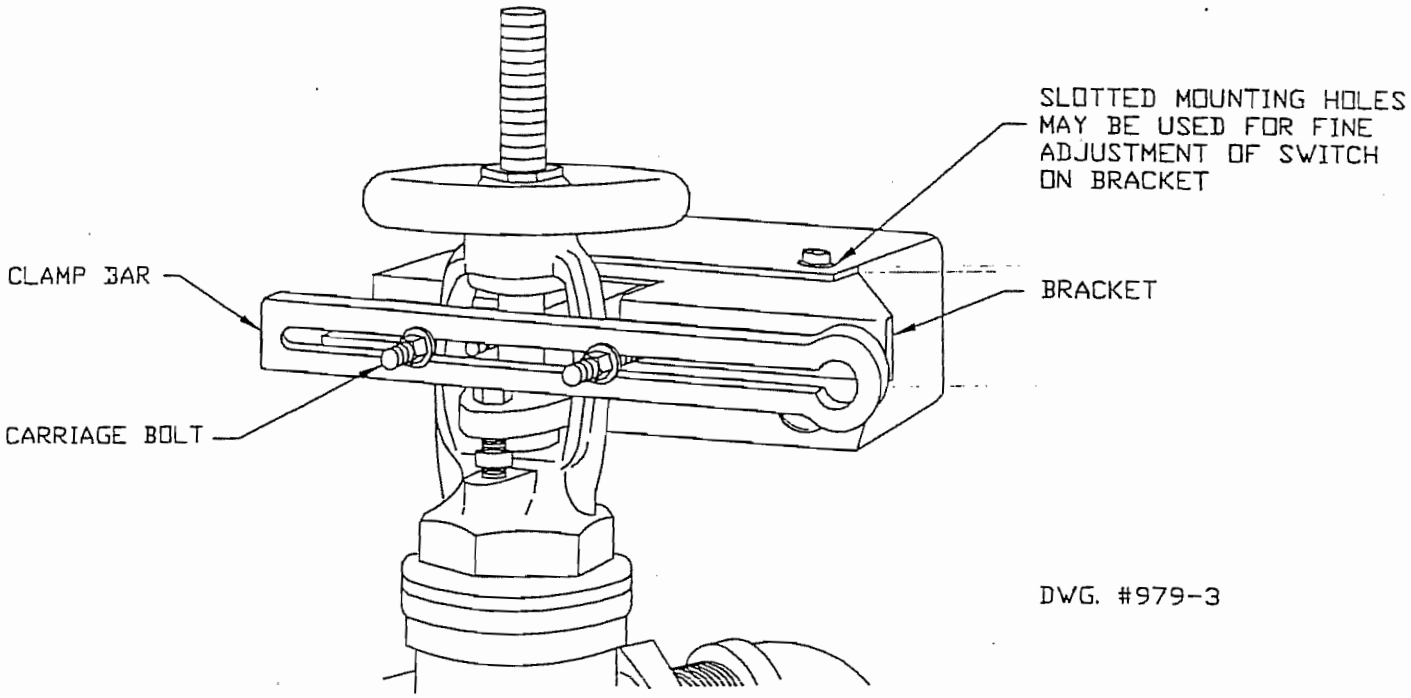
POTTER

OSYSU-1, -2

OUTSIDE SCREW AND YOKE VALVE
SUPERVISORY SWITCH

FIG. 1 SMALL VALVE INSTALLATION - 1/2" THRU 2 1/2" SIZES

THESE SWITCHES MOUNT CONVENIENTLY TO MOST 2" TO 12" OS & Y VALVES. THEY WILL MOUNT ON SOME VALVES AS SMALL AS 1/2". J-HOOKS MAY BE REQUIRED ON VALVES WITH LIMITED CLEARANCE.



SMALL VALVE INSTALLATION

1. Remove and discard "C" washer and roller from the trip rod.
2. With the valve in the FULL OPEN position, locate the OSYSU across the valve yoke as far as possible from the valve gland, so that the trip rod lays against the non-threaded portion of the valve stem.
3. Loosen the locking screw that holds the trip rod in place and adjust the rod length (see Fig. 4). When adjusted properly, the rod should extend past the valve screw, but not so far that it contacts the clamp bar. Tighten the locking screw to hold the trip rod in place.

   NOTE: If trip rod length is excessive, loosen the locking screw and remove the trip rod from the trip lever. Using pliers, break off the one (1) inch long notched section (see Fig. 5). Reinstall trip rod and repeat Step 3 procedure.
4. Mount the OSYSU loosely with the carriage bolts and clamp bar supplied. On valves with limited clearance use J-hooks supplied instead of the carriage bolts and clamp bar to mount the OSYSU.
5. Mark the valve stem at the center of the trip rod.
6. Remove the OSYSU. File a 1/8" deep groove centered on the mark on the valve stem utilizing a 3/16" diameter straight file. Round and smooth the edges of the groove to prevent damage to the valve packing and to allow the trip rod to move easily in and out of the groove as the valve is operated.
7. Mount the OSYSU with the trip rod centered in groove.
8. Final adjustment is made by loosening 2 screws (see Fig. 1) and sliding the OSYSU on the bracket. Adjustment is correct when switches are not activated with the trip rod seated in the valve stem groove and that the switches activate when the trip rod moves out of the groove.
9. Tighten the adjustment screws and all mounting hardware. Check to insure that the rod moves out of the groove easily and that the switches activate within one turn when the valve is operated from the FULL OPEN towards the CLOSED position.

NOTE: CLOSE THE VALVE FULLY TO DETERMINE THAT THE STEM THREADS DO NOT ACTIVATE THE SWITCH. THE SWITCH BEING ACTIVATED BY THE STEM THREADS COULD RESULT IN A FALSE VALVE OPEN INDICATION.

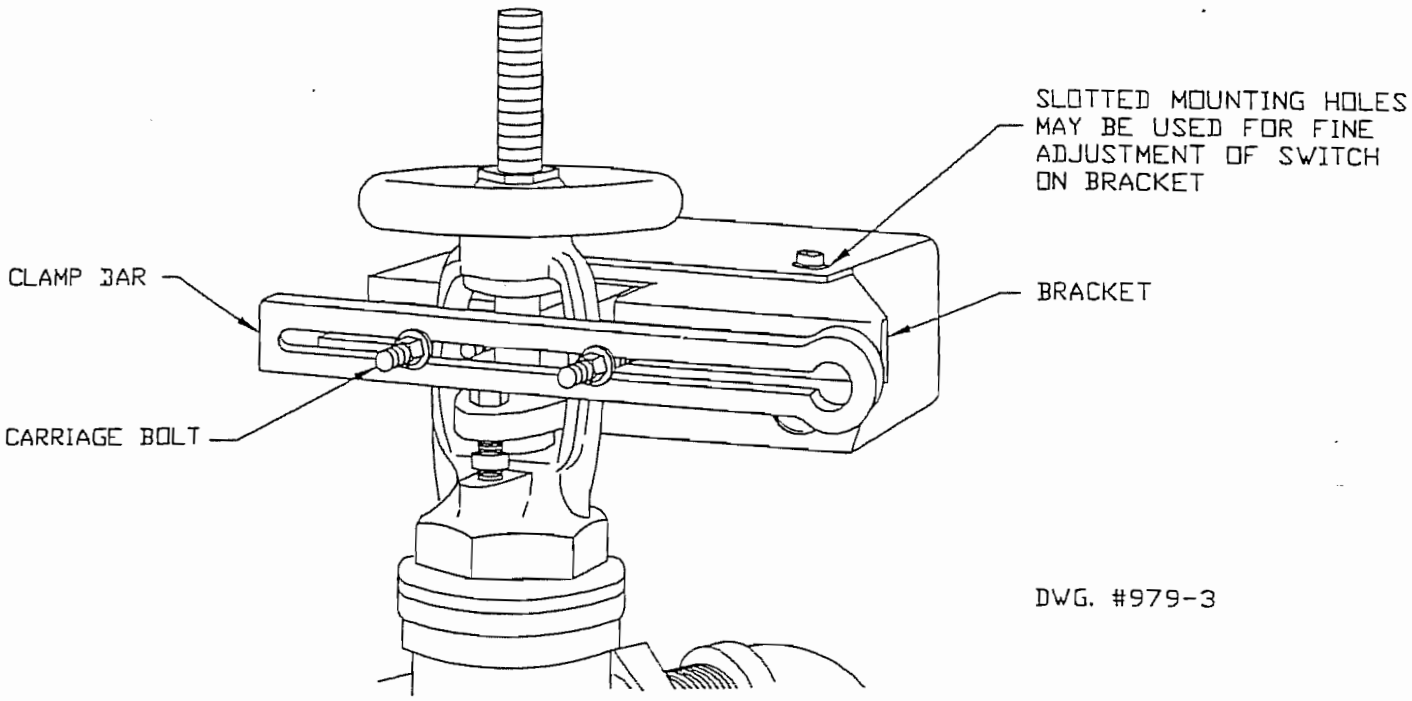
POTTER

OSYSU-1, -2

OUTSIDE SCREW AND YOKE VALVE
SUPERVISORY SWITCH

FIG. 1 SMALL VALVE INSTALLATION - 1/2" THRU 2 1/2" SIZES

THESE SWITCHES MOUNT CONVENIENTLY TO MOST 2" TO 12" OS & Y VALVES. THEY WILL MOUNT ON SOME VALVES AS SMALL AS 1/2". J-HOOKS MAY BE REQUIRED ON VALVES WITH LIMITED CLEARANCE.



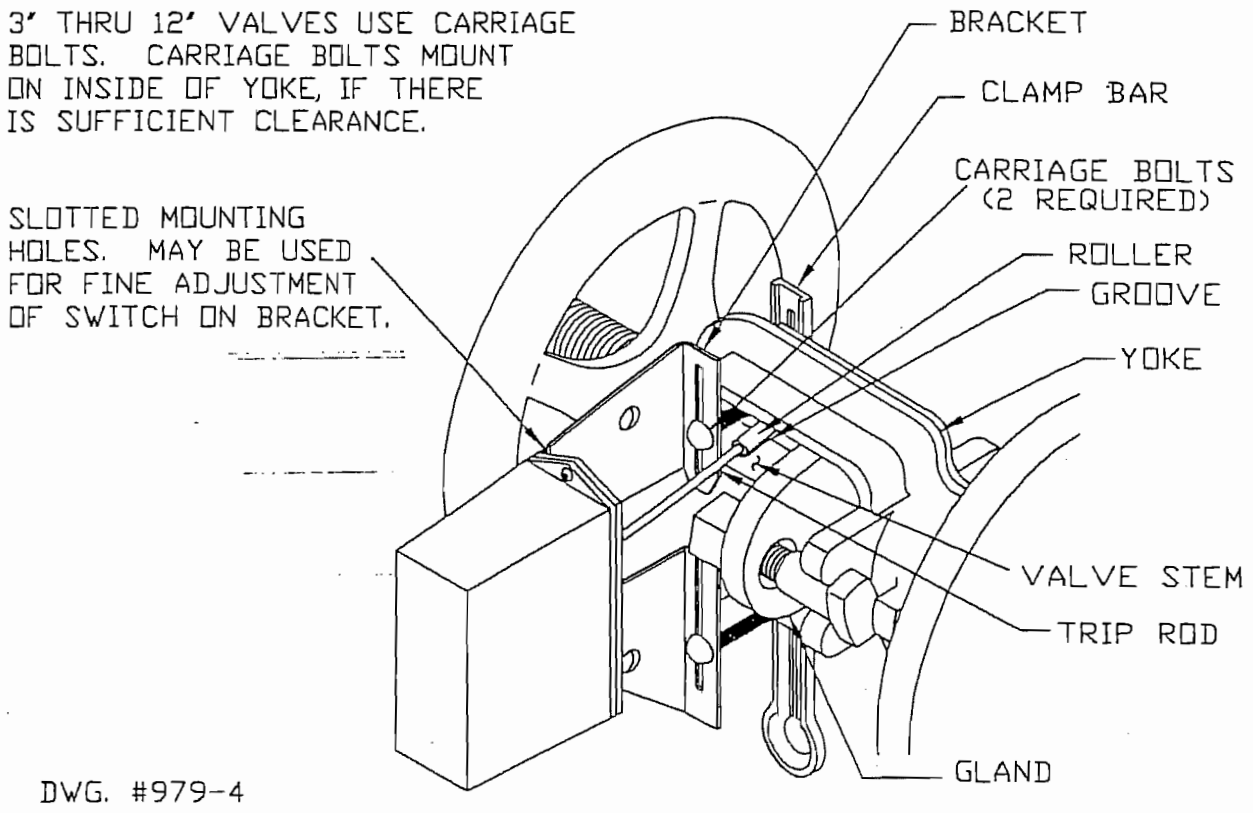
SMALL VALVE INSTALLATION

1. Remove and discard "C" washer and roller from the trip rod.
2. With the valve in the FULL OPEN position, locate the OSYSU across the valve yoke as far as possible from the valve gland, so that the trip rod lays against the non-threaded portion of the valve stem.
3. Loosen the locking screw that holds the trip rod in place and adjust the rod length (see Fig. 4). When adjusted properly, the rod should extend past the valve screw, but not so far that it contacts the clamp bar. Tighten the locking screw to hold the trip rod in place.

   NOTE: If trip rod length is excessive, loosen the locking screw and remove the trip rod from the trip lever. Using pliers, break off the one (1) inch long notched section (see Fig. 5). Reinstall trip rod and repeat Step 3 procedure.
4. Mount the OSYSU loosely with the carriage bolts and clamp bar supplied. On valves with limited clearance use J-hooks supplied instead of the carriage bolts and clamp bar to mount the OSYSU.
5. Mark the valve stem at the center of the trip rod.
6. Remove the OSYSU. File a 1/8" deep groove centered on the mark on the valve stem utilizing a 3/16" diameter straight file. Round and smooth the edges of the groove to prevent damage to the valve packing and to allow the trip rod to move easily in and out of the groove as the valve is operated.
7. Mount the OSYSU with the trip rod centered in groove.
8. Final adjustment is made by loosening 2 screws (see Fig. 1) and sliding the OSYSU on the bracket. Adjustment is correct when switches are not activated with the trip rod seated in the valve stem groove and that the switches activate when the trip rod moves out of the groove.
9. Tighten the adjustment screws and all mounting hardware. Check to insure that the rod moves out of the groove easily and that the switches activate within one turn when the valve is operated from the FULL OPEN towards the CLOSED position.

NOTE: CLOSE THE VALVE FULLY TO DETERMINE THAT THE STEM THREADS DO NOT ACTIVATE THE SWITCH. THE SWITCH BEING ACTIVATED BY THE STEM THREADS COULD RESULT IN A FALSE VALVE OPEN INDICATION.

FIG. 2 LARGE VALVE INSTALLATION - 3" THRU 12" SIZES



LARGE VALVE INSTALLATION

1. With the valve in the FULL OPEN position, locate the OSYSU across the valve yoke as far as possible from the valve gland, so that the trip rod lays against the non-threaded portion of the valve stem.

2. Mount the OSYSU loosely with the carriage bolts and clamp bar supplied.

3. Loosen the locking screw that holds the trip rod in place and adjust the rod length (see Fig. 4). When adjusted properly, the rod should extend past the valve screw, but not so far that it contacts the clamp bar. Tighten the locking screw to hold the trip rod in place.

   NOTE: If trip rod length is excessive, loosen the locking screw and remove the trip rod from the trip lever. Using pliers, break off the one (1) inch long notched section (see Fig. 5). Reinstall trip rod and repeat Step 3 procedure.

4. Mark the valve stem at the center of the trip rod.

5. Remove the OSYSU. File a 1/8" deep groove centered on the mark of the valve stem utilizing a 3/8" diameter straight file. Round and smooth the edges of the groove to prevent damage to the valve packing and to allow the trip rod to move easily in and out of the groove as the valve is operated.

6. Mount the OSYSU loosely with the trip rod centered in groove.

7. Final adjustment is made by loosening 2 screws (see Fig. 2) and sliding the OSYSU on the bracket. Adjustment is correct when switches are not activated with the trip rod seated in the valve stem groove and that the switches activate within one turn when the valve is operated from the FULL OPEN towards the CLOSED position.

8. Tighten the adjustment screws and mounting hardware. Check to insure that the rod moves out of the groove easily and that the switches activate within one turn when the valve is operated from the FULL OPEN towards the CLOSED position.

NOTE: CLOSE THE VALVE FULLY TO DETERMINE THAT THE STEM THREADS DO NOT ACTIVATE THE SWITCH. THE SWITCH BEING ACTIVATED BY THE STEM THREADS COULD RESULT IN A FALSE VALVE OPEN INDICATION.

OSYSU-1, -2

OUTSIDE SCREW AND YOKE VALVE SUPERVISORY SWITCH

FIG. 3 DIMENSIONS

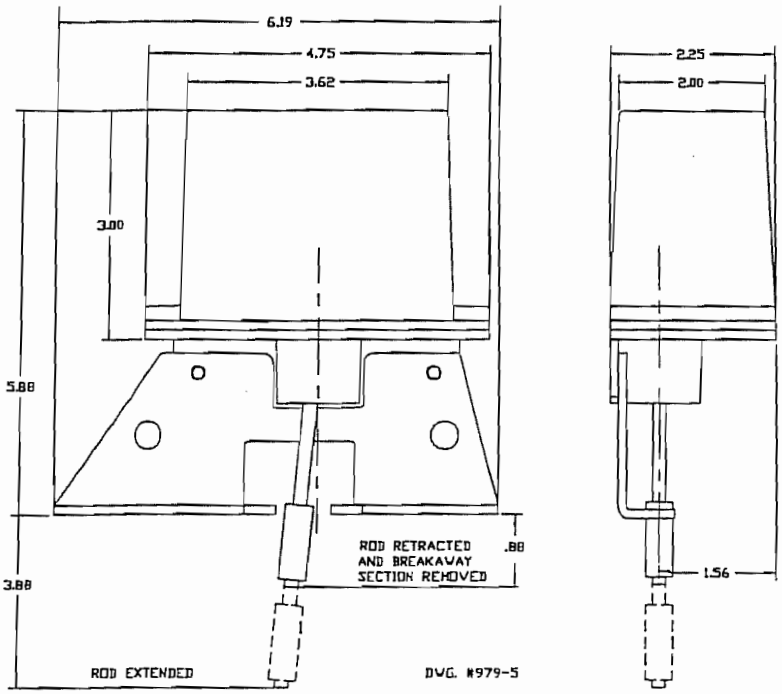


FIG. 4 PARTS

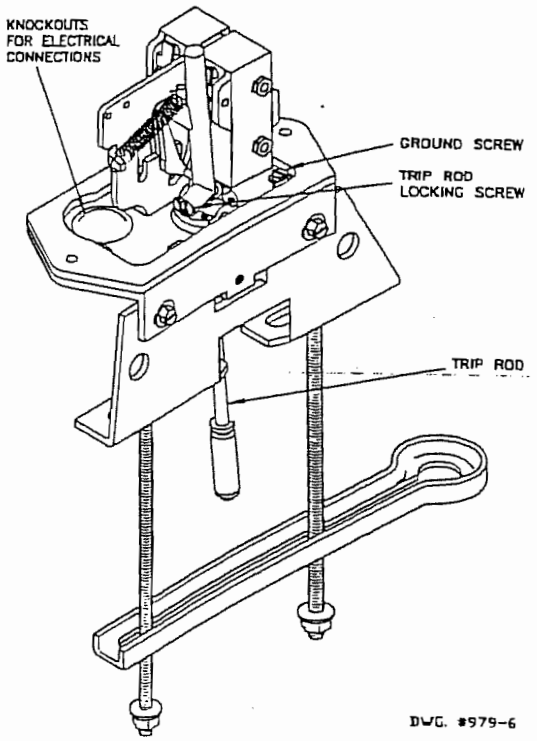
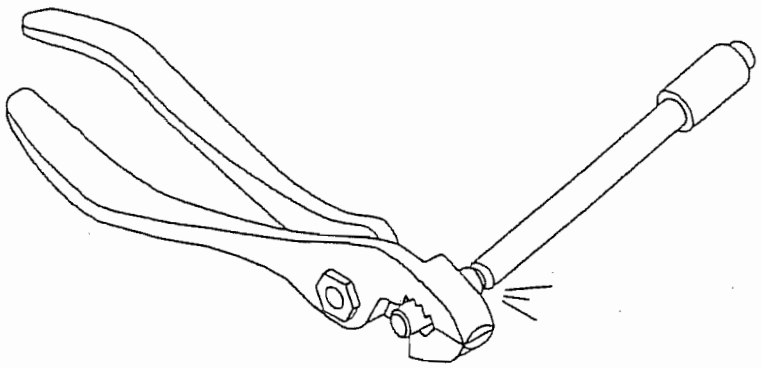
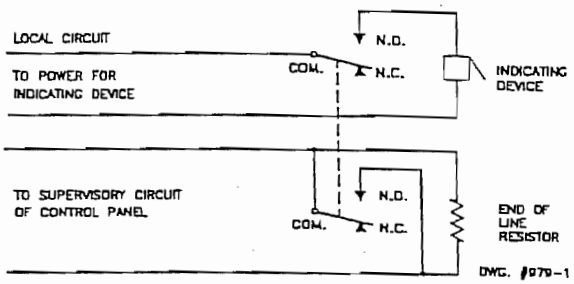


FIG. 5 BREAKING EXCESSIVE ROD LENGTH



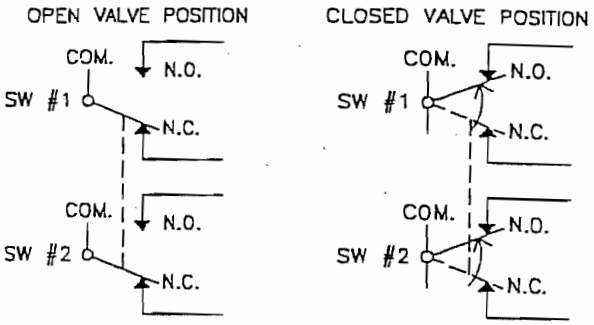
DWG. #979-7

TYPICAL ELECTRICAL CONNECTIONS



Contacts shown in normal (valve open) condition.

TYPICAL SWITCH ACTION



DWG. #979-2

ORDERING INFORMATION

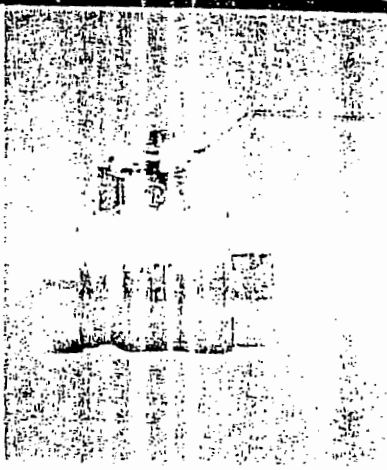
MODEL	DESCRIPTION	STK. NO.
OSYSU-1	Outside Screw & Yoke-Supervisory Switch (Single switch)	1010106
OSYSU-2	Outside Screw & Yoke-Supervisory Switch (Double switch)	1010206
–	Cover Screw	5490293
–	Hex Key for Cover Screws and Installation Adjustments	5250062
–	Optional Cover Tamper Switch Kit	0090131

For pressure reducer type valve installation kits (if required) contact valve manufacturer.

Ball Valves

Standard Port
150 PSI Saturated Steam
400 W.O.G.

Central Sprinkler Company
451 North Cannon Avenue, Lansdale, Pennsylvania 19446



Product Description

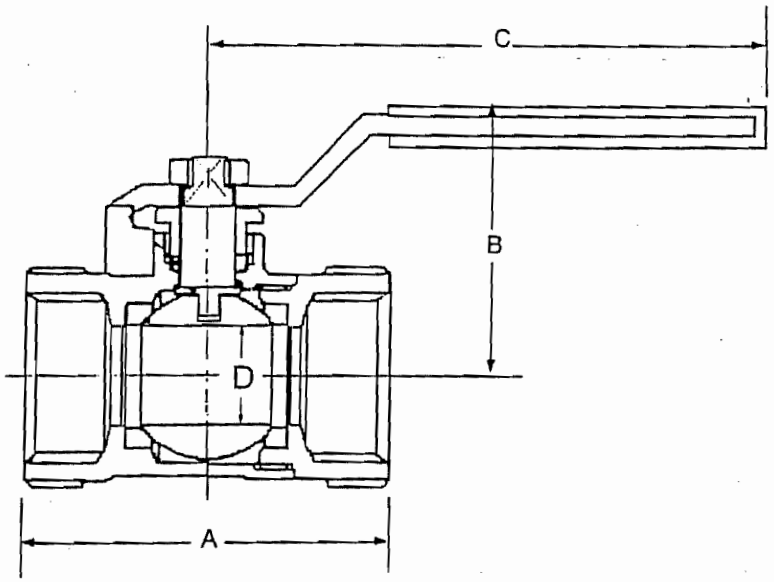
The Central Model F19 Ball Valves are recommended primarily for shut-off service or throttling flow where desired. Central Ball Valves are of high-quality construction and are rated at 150 psi with saturated steam, 400 psi with water, oil or gas, non-shock, well in excess of normal operating requirements in fire protection service.

The Central Model F19 Ball Valves are constructed of forged brass which ensures that there are no pin holes which may occur in alternate processes.

A large port size ensures good flow characteristics. Teflon* seats ensure smooth operation under normal operating conditions.

Each Ball Valve is tested twice with air under water to assure consistent quality.

Central Ball Valves include a vinyl covered handle for a comfortable, smooth grip. (Mfg. Source: Non-Domestic)



Dimensions (inches)

Nom. Size	A	B	C	Bore Size (D)
1/4"	1.65	1.50	3.31	0.320
1/2"	1.90	1.60	3.31	0.396
3/4"	2.20	1.70	3.31	0.591
1"	2.64	2.01	4.65	0.787
1 1/4"	3.00	2.17	4.65	1.050
1 1/2"	3.35	2.60	5.28	1.260
2"	3.82	2.80	5.28	1.500

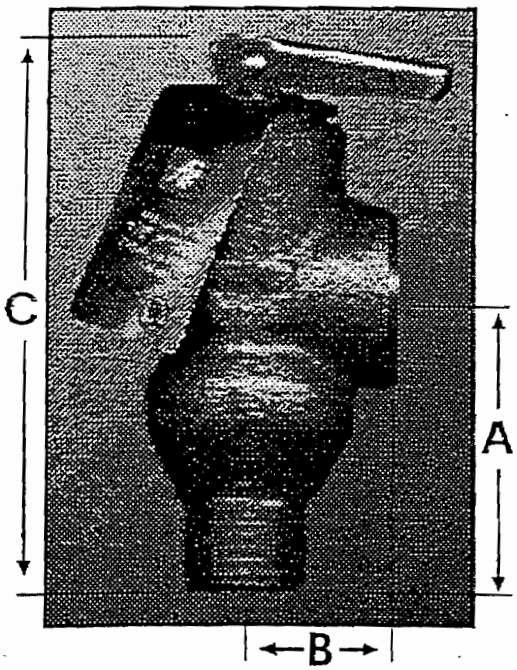
MODEL 7000

PRESSURE RELIEF VALVE

FOR FIRE SPRINKLER SYSTEMS

The AGF Manufacturing Inc. Model 7000 is a UL Listed/FM Approved Relief Valve Designed Specifically For Fire Sprinkler Systems, It Relieves Excess System Pressure Caused By Surges Or Temperature Changes. The Model 7000 Complies With The Requirements of NFPA-13 That Stipulates A Pressure Relief Valve Be Installed On All Gridded Systems And Downstream Of All Pressure Reducing Valves. The Model 7000 Is Included With Our **TESTANDRAIN** Model 1011, 1011T and 3011 **Inspector's Test** Valves.

UL Listed Pressure Relief Valve EX 4533 (N)



- ☐ UL Listed And FM Approved.
- ☐ Bronze Body With Stainless Steel Spring.
- ☐ Integral Flushing Handle To Remove Debris Causing Leaks Through Valve Seat And Disc.
- ☐ 1/2" IPT Inlet And Outlet.
- ☐ Factory Set At 175 PSI.*
- ☐ 165 PSI Through 205 PSI Available for Special Applications With Other Settings Available.*

* Note: It is important to note that the pressure rating of the relief valve indicates an operating range of pressure for both opening and closing of the valve. Standard relief valves are required to OPEN in a range of pressure between 90% and 105% of their rating. The valves are required to CLOSE at a pressure above 80% of that rating.

The relief valve should be installed where it is easily accessible for maintenance. Care should be taken that the relief valve CANNOT be isolated from the system when the system is operational. A relief valve should NEVER have a shutoff valve or a plug downstream of its outlet.

A	1 3/4" / 43.97mm
B	1" / 25.03mm
C	3 5/16" / 82.84mm

Check Out Our New AutoCAD Site!
Visit us on the Internet at
www.testandrain.com

The AGF Manufacturing, Inc. provides many different products to address a variety of job conditions. Please contact our office for advice and products modified to solve specific job conditions.

Call Our Office For New Product Information. Thank You For Using Our Products.

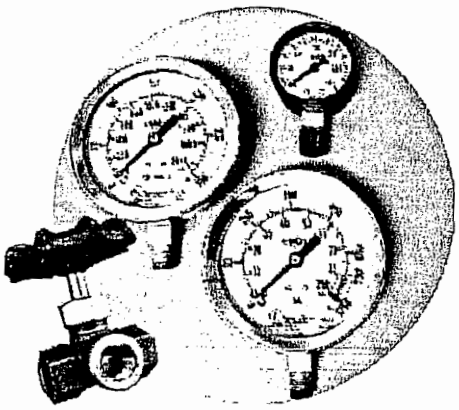
MADE IN U.S.A.

AGF MANUFACTURING INC.
100 Quaker Lane
Malvern, PA 19355 USA
Telephone: (610) 240-4900
Fax: (610) 240-4906
www.testandrain.com

JOB NAME: _____
ARCHITECT: _____
ENGINEER: _____
CONTRACTOR: _____

9/01

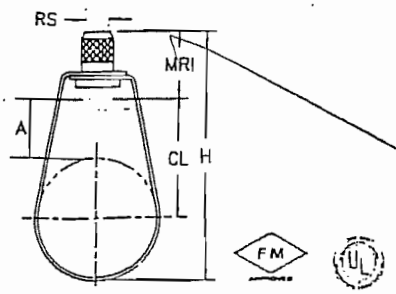
GAUGES



FOR USE WITH WET OR DRY SYSTEMS. GAUGES HAVE A BRONZE BURBON TUBE MOVEMENT IN A STAINLESS STEEL CASE (UNLESS OTHERWISE NOTED). 3-1/2" DIAMETER. U.L. AND F.M. APPROVED (UNLESS OTHERWISE NOTED).

Part No.	Description	Box Qty	Box Weight	Case Qty	Case Weight
GAAWSS350	AIR / WATER 0 - 300 PSI W/ STAINLESS STEEL CASE	60	42 #	480	535 #
GAASS250	AIR W/ RETARD 250 PSI 3-1/2" DIA, W/ STAINLESS STEEL CASE	60	40 #	480	530 #
GAWP200	2" RESIDENTIAL GAUGE 300 PSI (NOT U.L. OR F.M. APPROVED) W/ BLACK STEEL CASE	125	38 #	1000	520 #
GAUGE ACCESSORY PACK	AIR / WATER GAUGE 0 - 300 PSI W/ STAINLESS STEEL CASE, 1/4" X 4" NIPPLE, 1/4" 3-WAY VALVE, 1/4" PLUG, 1/2" X 1/4" HEXHEAD REDUCING BUSHING	AR*			

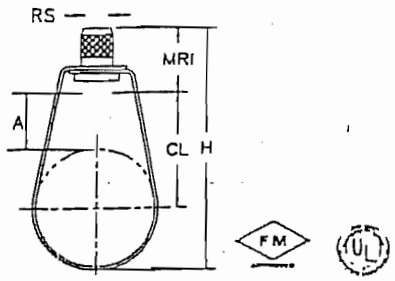
Model #115
Heavy Duty Swivel
Loop Hanger (NFPA Rod Sizes)



SIZE RANGE: 1/2" thru 8" pipe sizes
MATERIAL: Pre-galvanized carbon steel with a zinc electroplate insert nut.
APPROVALS: Factory Mutual (FM)
LISTINGS: Underwriters Laboratories (UL)
CONFORMS WITH: Federal Specification WW-H-171 (Type 10); Manufacturers Standardization Society ANSI/MSS-SP-58 (Type 10); install in accordance with ANSI/MSS-SP-69.
SERVICE: Pipe support manufactured to use minimum rod sizes permitted by NFPA for fire sprinkler piping.
ORDERING: Specify pipe size, model number and name.

Pipe size	H	CL	RS	MRI	A	Max. recom. load lbs.
1/2"	3-1/8"	1-5/8"	3/8"	1"	1-1/4"	300
3/4"	3-1/16"	1-1/2"	3/8"	1"	15/16"	300
1"	3-3/16"	1-1/2"	3/8"	1"	15/16"	300
1-1/4"	3-1/2"	1-11/16"	3/8"	1"	7/8"	300
1-1/2"	3-15/16"	1-15/16"	3/8"	1"	1"	300
2"	4-1/2"	2-1/4"	3/8"	1"	1-1/16"	300
2-1/2"	5-5/16"	3-3/8"	3/8"	1"	1-1/2"	525
3"	6-1/2"	3-5/8"	3/8"	1"	1-7/8"	525
3-1/2"	7-1/16"	3-15/16"	3/8"	1"	1-7/8"	585
4"	7-1/2"	4-1/8"	3/8"	1"	1-7/8"	650
5"	8-15/16"	4-13/16"	1/2"	1-1/4"	2-3/16"	1000
6"	11-1/16"	6-3/8"	1/2"	1-1/4"	3-3/16"	1000
8"	12-7/8"	7-3/16"	1/2"	1-1/4"	3-1/16"	1000

Model #130
Service Weight Swivel
Ring Hanger (NFPA Rod Sizes)



SIZE RANGE: 1/2" thru 8" pipe sizes
MATERIAL: Pre-galvanized carbon steel with zinc electroplate insert nut.
APPROVAL: Factory Mutual (FM)
LISTING: Underwriters Laboratories (UL)
CONFORMS WITH: Federal Specification WW-H-171 (Type 10), Manufacturers Standardization Society ANSI/MSS-SP-58 (Type 10); install in accordance with ANSI/MSS-SP-69.
SERVICE: Pipe support manufactured to use minimum rod sizes permitted by NFPA for fire sprinkler piping.
ORDERING: Specify pipe size, model number and name.

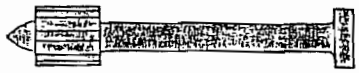
Pipe size	H	CL	RS	MRI	A	Max. recom. load lbs.
1/2"	3-1/8"	1-5/8"	3/8"	1"	1-1/4"	300
3/4"	3-1/16"	1-1/2"	3/8"	1"	15/16"	300
1"	3-3/16"	1-1/2"	3/8"	1"	15/16"	300
1-1/4"	3-1/2"	1-11/16"	3/8"	1"	15/16"	300
1-1/2"	3-15/16"	1-15/16"	3/8"	1"	1-1/16"	300
2"	4-1/2"	2-1/4"	3/8"	1"	1-1/8"	300
2-1/2"	5-7/8"	2-3/8"	3/8"	1"	1-3/8"	525
3"	6-9/16"	3-3/4"	3/8"	1"	1-1/2"	525
3-1/2"	7"	4-15/16"	3/8"	1"	1-3/4"	585
4"	7-11/16"	4-3/16"	3/8"	1"	1-13/16"	650
5"	8-5/8"	4-1/2"	1/2"	1 1/4"	1-7/8"	1000
6"	9-3/4"	5-1/16"	1/2"	1 1/4"	2-3/16"	1000
8"	12-1/4"	6-5/8"	1/2"	1 1/4"	2-7/16"	1000



100 Pack Pins
3/8" Head Diameter Drive Pins

- designed for heavy duty applications

Catalog Number	Shank Length	Shank Diameter	MD380
3306K	3/4" (Knurled)	.170	■
3310	1-1/4"	.170	■
3335	1-1/2"	.170	■
3320	2"	.170	■
3337	2-1/2"	.170	■
3330	3"	.170	■
3348	3-1/8" (Step Shank)	.215/.182	■



100 Pack Pins
8MM Head Diameter Drive Pins

- manufactured for use in specific Hilti model tools

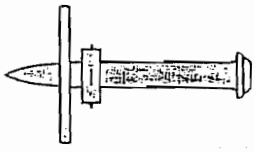
Catalog Number	Shank Length	Shank Diameter
4705K	5/8" (Knurled)	.140
4706	3/4"	.140
4708	1"	.140
4710	1-1/4"	.140
4712	1-1/2"	.140
4716	2"	.140
4720	2-1/2"	.140



100 Pack Pins
8MM Head Diameter Drive Pins

- manufactured for use in specific Hilti model tools

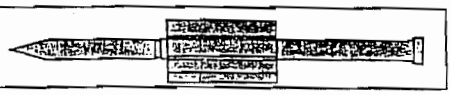
Catalog Number	Shank Length	Shank Diameter
4708SD	1"	.140
4710SD	1-1/4"	.140
4712SD	1-1/2"	.140
4716SD	2"	.140
4720SD	2-1/2"	.140



Snap-It Forming Pin (Available in 1000 Packs)

Specifically designed for temporary 2 x 4 applications (i.e. formwork)
- the small head allows wood to be pulled over pin for reuse of the wood
- the notch allows the pin to breakaway approximately 1/8" below the concrete surface for easy repair

Catalog Number	Shank Length	Shank Diameter	4170	DG0	DG0L	SA270	R300
1516FP	2-1/2"	.140	■	■	■	■	■



Threaded Studs

1/4"-20 Threaded Studs

Catalog Number	Thread Length	Shank Length	Shank Diameter	721	S38	4170	DG0	DG0L	SA270	R300
1622WK	1/2"	1/2" (Knurled)	.140	■	■	■	■	■	■	■
1623WK	3/4"	1/2" (Knurled)	.140	■	■	■	■	■	■	■
1642W	1/2"	1"	.140	■	■	■	■	■	■	■
1643W	3/4"	1"	.140			■	■	■	■	■
1644W	1"	1"	.140			■	■	■	■	■
1653W	3/4"	1-1/4"	.140			■	■	■	■	■



- for applications that require removability, where shimming is required

3/8"-16 Threaded Studs

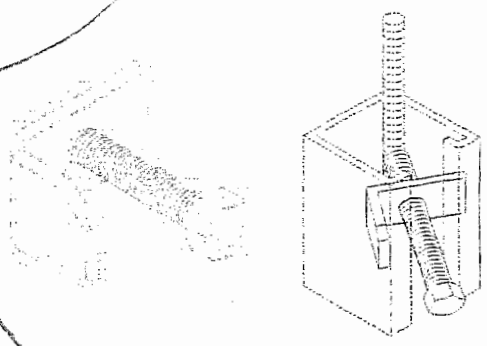
Catalog Number	Thread Length	Shank Length	Shank Diameter	MD380
0140K	1"	5/8" (Knurled)	.205	■
0150	1"	1-1/16"	.205	■
0100	1"	1-1/4"	.205	■
0106	1"	1-11/16"	.205	■



- designed for heavy duty applications such as the attachment of sprinkler systems

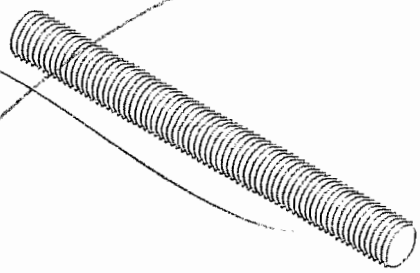
Fig. 98 - Rod Stiffener

Component of State of California OSHPD Approved Seismic Restraints System



Size Range — Secures 3/8" thru 7/8" hanger rod
Material — Carbon Steel
Function — Secures channel to hanger rod for vertical seismic bracing.
Approvals — Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development (**OSHPD**). For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines
Finish — Electro Galvanized
Note — Available in HDG finish or Stainless Steel materials.
Order By — Figure number

Fig. 99 - All Thread Rod Cut to Length

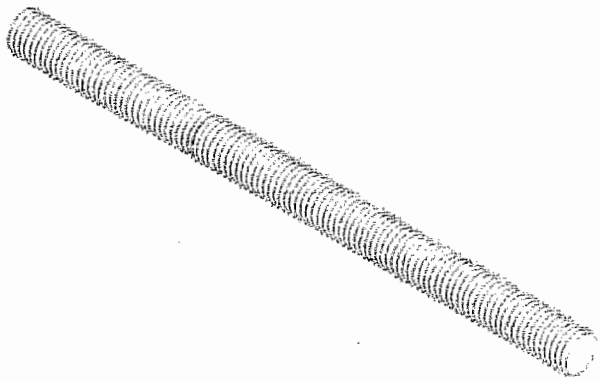


Size Range — Secures 3/8" thru 7/8" rod in 1" increments
Material — Carbon Steel
Maximum Temperature — 750°F
Finish — Plain
Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.
Order By — Figure number, rod diameter, rod length and finish

Dimensions

Rod Size	Max. Rec. Load Lbs. For Service Temps 650°F	750°F
3/8	610	540
1/2	1130	1010
5/8	1610	1610
3/4	2710	2420
7/8	3770	3360

Fig. 100 - All Thread Rod Full Lengths



Size Range — Secures 3/8" thru 1½" rod in 10' lengths
Material — Carbon Steel
Maximum Temperature — 750°F
Finish — Plain
Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.
Order By — Figure number, rod diameter and finish

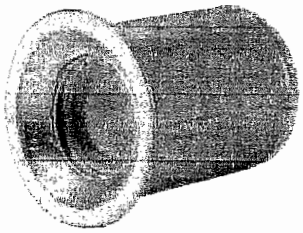
Dimensions • Weights

Rod Size	Max Rec. Load Lbs. For Service Temps 650°F	750°F	Approx. Wt./100
1/4	240	215	12
3/8	730	540	29
1/2	1350	1010	53
5/8	2160	1610	84
3/4	3230	2420	123
7/8	4480	3360	169
1	5900	4420	222
1¼	9500	7140	360
1½	13800	10370	510

OFFICE/MANUFACTURING FACILITY • 1375 SAMPSON AVE. • CORONA, CA 92879 • PH: 951.737.5599 • FAX: 951.737.0330
CUSTOMER SERVICE • 800.786.5266
www.tolco.com

4.3.9 HDI-P Drop-In Anchor

4.3.9.1 Product Description
4.3.9.2 Material Specifications
4.3.9.3 Technical Data
4.3.9.4 Installation Instructions
4.3.9.5 Ordering Information



Listings/Approvals

ICC-ES (International Code Council)
ESR-1291

COLA (City of Los Angeles)
Research Report No. 25350

Factory Mutual (FM)
Pipe Hanger Components for Automatic Sprinkler Systems

4.3.9.1 Product Description

The Hilti HDI-P Drop-In anchor is an internally threaded, flush mounted expansion anchor for solid and hollow concrete.

Product Features

- Optimized 3/4" anchor length to allow reliable fastenings in hollow core panels, precast plank & post tensioned slabs
- Shallow drilling enables fast installation
- Lip provides flush installation, consistent anchor depth and easy rod alignment
- Setting tool leaves mark on flange when anchor is set properly to enable inspection & verification of proper expansion

Guide Specifications

Expansion Anchor Expansion anchors shall be flush or shell type and zinc plated in accordance with ASTM B 633, SC 1, Type III. Anchors shall be Hilti HDI-P anchors as supplied by Hilti.

Installation Install shell or flush type anchors in holes drilled with Hilti carbide tipped drill bits. Install anchors in accordance with manufacturer's recommendations.

4.3.9.2 Material Specifications

The HDI-P is manufactured from mild carbon steel, which is zinc plated for corrosion protection in accordance with ASTM B 633, SC 1, Type III

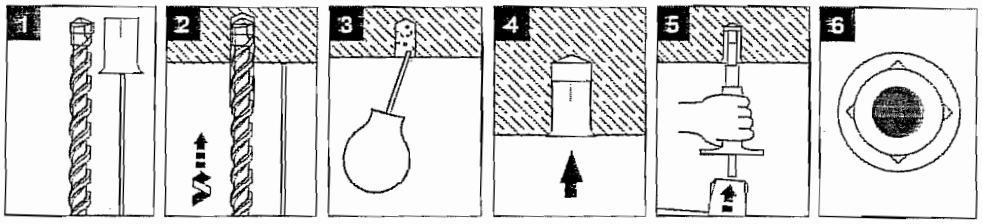
4.3.9.3 Technical Data

HDI-P Specification Table

Desc.	Length in. (mm)	Bit Size[1] in.	Average Ultimate Loads, lb (kN)				Allowable Loads, lb (kN)			
			4000 psi Concrete (27.6 MPa)		Hollow Core (Spancrete)		4000 psi Concrete (27.6 MPa)		Hollow Core (Spancrete)	
			Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
HDI-P 3/8	3/4 (19.1)	1/2	1900 (8.5)	3000 (13.3)	2100 (9.3)	4000 (17.8)	380 (1.7)	600 (2.7)	420 (1.9)	800 (3.6)

1 For Hilti matched tolerance carbide tipped drill bits, see section 8.4.1.

4.3.7.4 Installation Instructions



1. Set depth gauge on drill.
2. Hammer-drill hole.
3. Clean hole.
4. Insert anchor.
5. Insert setting tool and strike with hammer until anchor is fully set.
6. Collar of setting tool will leave an indentation on flange of anchor when properly expanded.

4.3.9.5 Ordering Information

HDI-P Anchor

Item No.	Description	Bit Dia	Box Qty
283611	HDI-P 3/8	1/2"	100

Setting Tools for HDI-P Anchors

Item No.	Description
283611	HSD-G 3/8" – 3/4" Setting Tool w/ hand guard
253784	HST-P 3/8" – 3/4" Setting Tool

BEAM CLAMP MODELS 300 & 310

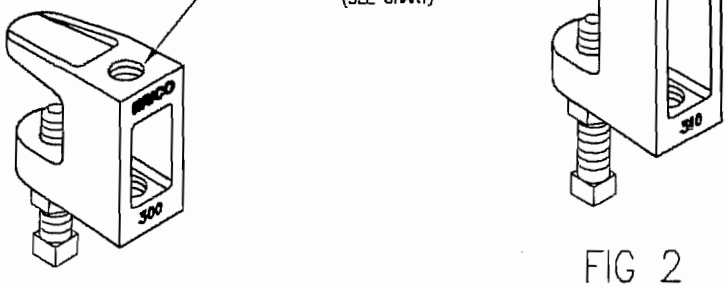


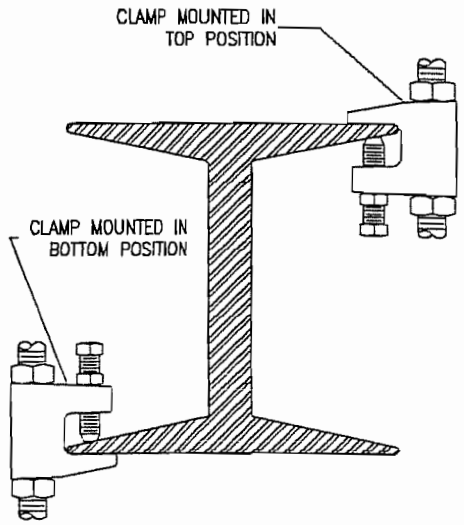
FIG 1

FIG 2

FEATURES

Allows structural attachment to top or bottom of metal beams, purlins, channel or angle iron to support hanger rod.

Location of threaded rod insertion permits easy attachment to other fixtures.



SEE REVERSE FOR APPLICATION DETAIL

WARNING

1. ERICO products shall be installed and used only as indicated in ERICO product instruction sheets and training materials. Instruction sheets are available at www.erico.com and from your ERICO customer service representative.
2. ERICO products must never be used for a purpose other than the purpose for which they were designed or in a manner that exceeds specified load ratings.
3. All instructions must be completely followed to ensure proper and safe installation and performance.
4. Improper installation, misuse, misapplication or other failure to completely follow ERICO's instructions and warnings may cause product malfunction, property damage, serious bodily injury and death.
5. Products that are manufactured using spring steel components shall be used only in a non-corrosive indoor environment.
6. All pipe supports, hangers, intermediate components and structural attachments must ONLY be used as described herein and are NEVER to be used for any other purpose.

NOTE: All load ratings are for static conditions and do not account for dynamic loading such as wind, water or seismic loads, unless otherwise noted.

The customer is responsible for:
a. Conformance to all governing codes.
b. The integrity of structures to which the products are attached, including their capability of safely accepting the loads imposed, as evaluated by a qualified engineer.
c. Using appropriate industry standard hardware as noted above.

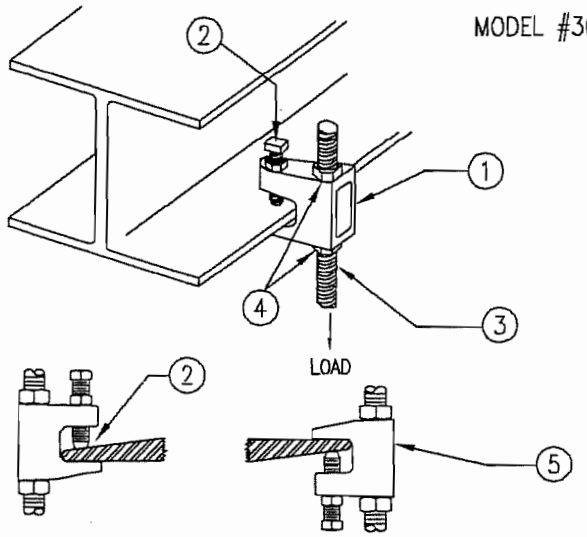
SAFETY INSTRUCTIONS: All governing codes and regulations and those required by the job site must be observed. Always use appropriate safety equipment such as eye protection, hard hat, and gloves as appropriate to the application.

CADDY, CADWELD, CRITEC, ERICO, ERIFLEX, ERITECH and LENTON are registered trademarks of ERICO International Corporation.

 © 2007 ERICO, INC.

MODEL NUMBER	FIG. NO.	DESCRIPTION	MAX. PIPE DIA. SUPPORTED BY CLAMP & THREADED ROD	ROD SIZE	MAX. RECOM. LOAD LBS.	
					TOP	BOTTOM
300	1	Reversible Beam Clamp to secure threaded rod to structure	4"	3/8"	500	250
300	1	Reversible Beam Clamp to secure threaded rod to structure	8"	1/2"	950	760
300	1	Reversible Beam Clamp to secure threaded rod to structure	8"	5/8"	950	760
300	1	Reversible Beam Clamp to secure threaded rod to structure	8"	3/4"	950	760
300	1	Reversible Beam Clamp to secure threaded rod to structure	8"	7/8"	950	760
310	2	Reversible "Big Mouth" Beam Clamp to secure threaded rod to structure	4"	3/8"	500	250
310	2	Reversible "Big Mouth" Beam Clamp to secure threaded rod to structure	8"	1/2"	950	760

MODEL #300 (FIG 1)



1. Position Clamp on beam.

2. Tighten screw. Set screw must be tightened to sloped side of I-beam, channel, or angle iron flange and torqued to 60 inch pounds. Locknut required to resist vibration.

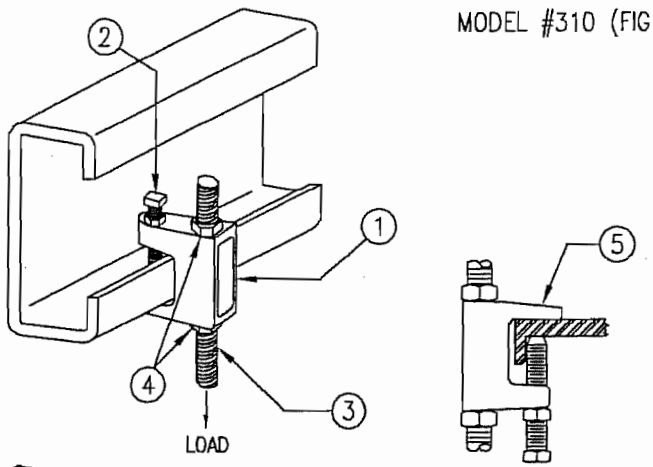
3. Insert rod into threaded hole, adjust to desired height.

4. Lock in place with jam nut.

5. Clamp may be secured in reverse position as shown.

NOTE: Threaded rod and two hex nuts are not included.

MODEL #310 (FIG 2)



1. Position Clamp on beam.

2. Tighten screw. Set screw must be tightened onto sloped side of I-beam, channel or angle iron flange and torqued to 60 inch pounds for 3/8" rod size and 125 inch pounds for the 1/2" rod size. Locknut required to resist vibration.

3. Insert rod into threaded hole, adjust to desired height.

4. Lock in place with jam nut.

5. Clamp may be secured in reverse position as shown.

NOTE: Threaded rod and two hex nuts are not included.

© 2007 ERICO, INC.

DYNA-FLOW®

Dyna-Flow®

High Strength Steel Pipe

The original high-strength lightwall sprinkler pipe with hydraulics superior to Schedule-10.

Dyna-Flow pipe is the "original" high-strength lightwall sprinkler pipe. Dyna-Flow has outstanding hydraulic capabilities and is recognized as the most popular alternative to Schedule-10 pipe. Lightweight, easy to cut and easy to handle for installation. Dyna-Flow is a valuable addition to any fire protection system.

Superior Hydraulics

With an inside diameter of up to 11% larger than Schedule-40 and up to 7% larger than Schedule-10, Dyna-Flow pipe hydraulics are exceptional. Larger I.D.s enable Dyna-Flow, and related components, to be down-sized within the system, thus increasing the potential for job cost savings. For complete Hazen-Williams charts, refer to "Dyna-Flow Hydraulic Data Tables."

Specifications

NPS *In; mm*	Nominal I.D. *In; mm*	Wt. *Lbs/Ft; Kg/m*	Wt. (H20 Filled) *Lbs/Ft; Kg/m*	Pcs/ *Lift*	Wt/Lift (21') *Lbs; Kg*	Wt/Lift (24') *Lbs; Kg*	Wt/Lift (25') *Lbs; Kg*
1"	1.191	0.830	1.31	91	1,586	1,812	1,888
25	*30.3*	*1.2*	*1.95*	*91*	*719*	*822*	*856*
1¼"	1.536	1.059	1.87	61	1,356	1,550	1,615
32	*39.0*	*1.6*	*2.78*	*61*	*615*	*703*	*733*
1½"	1.728	1.667	2.71	61	2,135	2,440	2,542
40	*43.9*	*2.5*	*4.03*	*61*	*968*	*1107*	*1153*
2"	2.203	2.104	3.79	37	1,634	1,868	1,946
50	*56.0*	*3.1*	*5.64*	*37*	*741*	*847*	*883*
2½"	2.703	2.564	5.10	30	1,615	1,846	1,923
65	*68.7*	*3.8*	*7.59*	*30*	*733*	*837*	*872*
3"	3.314	3.387	7.18	19	1,351	1,544	1,608
80	*84.2*	*5.0*	*10.69*	*19*	*613*	*700*	*729*
4"	4.310	4.473	10.86	19	1,784	2,039	2,124
90	109.5	6.7	16.16	19	809	925	963

Coatings & Fabrication

Dyna-Flow products are coated with an environmentally approved and specially formulated modified-acrylic or water-based coating. This durable coating is paintable. The black coating acts as an excellent primer and is resistant to weathering and U.V. degradation from outdoor storage.

Metallurgical properties provide excellent fabrication characteristics for end prep finishes, welding and roll grooving. There is no special process or equipment needed for fabrication and installation.

The internal surface of all black Allied Tube & Conduit Fire Sprinkler pipe products up to 4.5000" in diameter is coated with our new Antibacterial Formula, "ABF". In scientific laboratory test, ABS proved to have superior resistance to microbial colonization of pipe walls, thereby delaying or possibly preventing the onset of Microbiologically Influenced corrosion (MIC) when the First Sprinkler System is first installed.

Specifications & Approvals

Dyna-Flow/Super Flo pipe is manufactured to meet ASTM A-795 Type E, Grade A and is in compliance with NFPA-13 and NFPA-14. All sizes of Dyna Flow/Super Flo are UL Listed, FM Approved and ULC Listed.

UL Listed FM Approved ULC Listed

Dyna-Flow/Super Flo is UL/ULC Listed for use with roll grooved, plain-end couplings, and welded joints for wet, dry, preaction and deluge systems. It is FM Approved for roll grooved, plain-end, and welded joints for wet systems. Refer to appropriate documentation for up-to-date listing and approval information. Dyna-Flow/Super Flo is now available "hot-dip" galvanized and has been specifically approved by FM for dry systems uses.

Additional Benefits

- Lightweight and easy to install, resulting in more efficient use of your freight and labor dollars.
- Provides stability needed to comply with standard hanger spacing (15 ft O.C.) per NFPA.
- Available in Standard lengths for your convenience, or can be ordered in custom lengths upon approval.
- Fast cutting and welding, as well as easy roll grooving and end preparation.
- Available in Factory roll grooved form for quicker shop turnaround.
- Clean, durable mill coating provides longer "shelf life" and acts as an excellent primer for custom paint applications.

tyco
a vital part of your world

allied TUBE & CONDUIT

16100 S. Lathrop • Harvey, IL 60426
11350 Norcom Rd. • Philadelphia, PA 19154
2525 N. 27 th Ave. • Phoenix, AZ 85009

Customer Service:
(800) 882-5543
Fax 708-339-1806

DYNA THREAD®

Dyna-Thread®

Full Line Sch-40 Replacement

Dyna-Thread® offers the life expectancy of Sch-40 with superior hydraulics and greater value.

Dyna-Thread sprinkler pipe represents an engineering advancement for the sprinkler pipe industry. It combines the safety and longevity of traditional Sch-40 pipe with quality and superior hydraulic advantages.

Comparison to Schedule 40

- Dyna-Thread's inside diameter is up to 3.6% larger than Sch-40 giving it superior hydraulics. And, when used in combination with Dyna-Flow pipe, down sizing often occurs.
- Dyna-Thread is fully listed and approved by UL, ULC, and FM for fire sprinkler applications.
- The life expectancy of Dyna-Thread and Sch-40 are equal based on the calculated wall thicknesses per UL.
- The consistent quality of steel used to make Dyna-Thread facilitates smooth threading and lower maintenance costs.
- The exterior of Dyna-Thread is protected by a clean, durable mill coating for extended shelf life and easy paint application.
- With its increased strength and lighter weight, Dyna-Thread reduces installation fatigue and is ideal for retro-fit applications.

Corrosion Resistance Ratio (CRR) is a UL (Underwriters Laboratory) term for the estimated life expectancy of a pipe joint. This is based on the calculated wall thickness at the base of the first exposed thread, assumed to be the weakest point of the pipe length. Dyna-Thread and Sch-40 have the same calculated wall thicknesses at this point and are both assigned the same CRR of 1.00.

The internal surface of all black Allied Tube & Conduit Fire Sprinkler pipe products up to 4.5000" in diameter is coated with our new Antibacterial Formula, "ABF". In scientific laboratory test, ABS proved to have superior resistance to microbial colonization of pipe walls, thereby delaying or possibly preventing the onset of Microbiologically Influenced corrosion (MIC) when the First Sprinkler System is first installed.

Listed Approved Listed

Comparison to L.W.T. Pipes

- More wall thickness at the thread (CRR=1.00) gives Dyna-Thread better life expectancy than lightwall threadable pipe joints.
- Unlike lightwall threadable pipe, Dyna-Thread has no thread gauge warning.
- Dyna-Thread is approved for standard hanger spacing (15 ft. O.C.), can be used as earthquake sway bracing, and is safe to use as drops.
- Dyna-Thread is safer to weld on.
- Dyna-Thread is more widely accepted than lightwall threadable where Sch-40 is specified.

Specifications & Approvals

Super 40/Dyna-Thread pipe is manufactured to meet: ASTM A-135, Grade A and is in compliance with NFPA-13. All sizes of Super 40/Dyna-Thread are rated at 300 psi working pressure. Super 40/Dyna-Thread is UL and ULC Listed for wet, dry deluge and pre-action sprinkler systems and FM Approved for use in wet systems. Super 40/Dyna-Thread can be "hot-dip" galvanized to meet FM requirement for dry systems. Super 40/Dyna-Thread is approved for all threaded couplings and welded outlets and is suitable for all roll-grooved, and plain-end fittings. (See listing information).

Specifications

NPS *In; mm*	Nominal I.D. *In; mm*	Wt. *Lbs/Ft; Kg/m*	Wt. (H2O Filled) *Lbs/Ft; Kg/m*	Pcs/ *Lift*	Wt/Lift (21') *Lbs; Kg*	Wt/Lift (24') *Lbs; Kg*	Wt/Lift (25') *Lbs; Kg*
1"	1.080	1.330	1.75	70	1955	2234	2327
25	*27.4*	*2.0*	*2.60*	*70*	*887*	*1013*	*1056*
1¼	1.408	1.870	2.54	51	2002	2288	2384
32	*35.8*	*2.8*	*3.78*	*51*	*908*	*1038*	*1081*
1½	1.639	2.290	3.22	44	2115	2418	2519
40	*41.6*	*3.4*	*4.79*	*44*	*959*	*1097*	*1143*
2"	2.104	3.050	4.57	30	1921	2196	2287
50	*53.4*	*4.5*	*6.80*	*30*	*871*	*996*	*1037*

tyco a vital part of your world

allied TUBE & CONDUIT

16100 S. Lathrop • Harvey, IL 60426
11350 Norcom Rd. • Philadelphia, PA 19154
2525 N. 27 th Ave. • Phoenix, AZ 85009

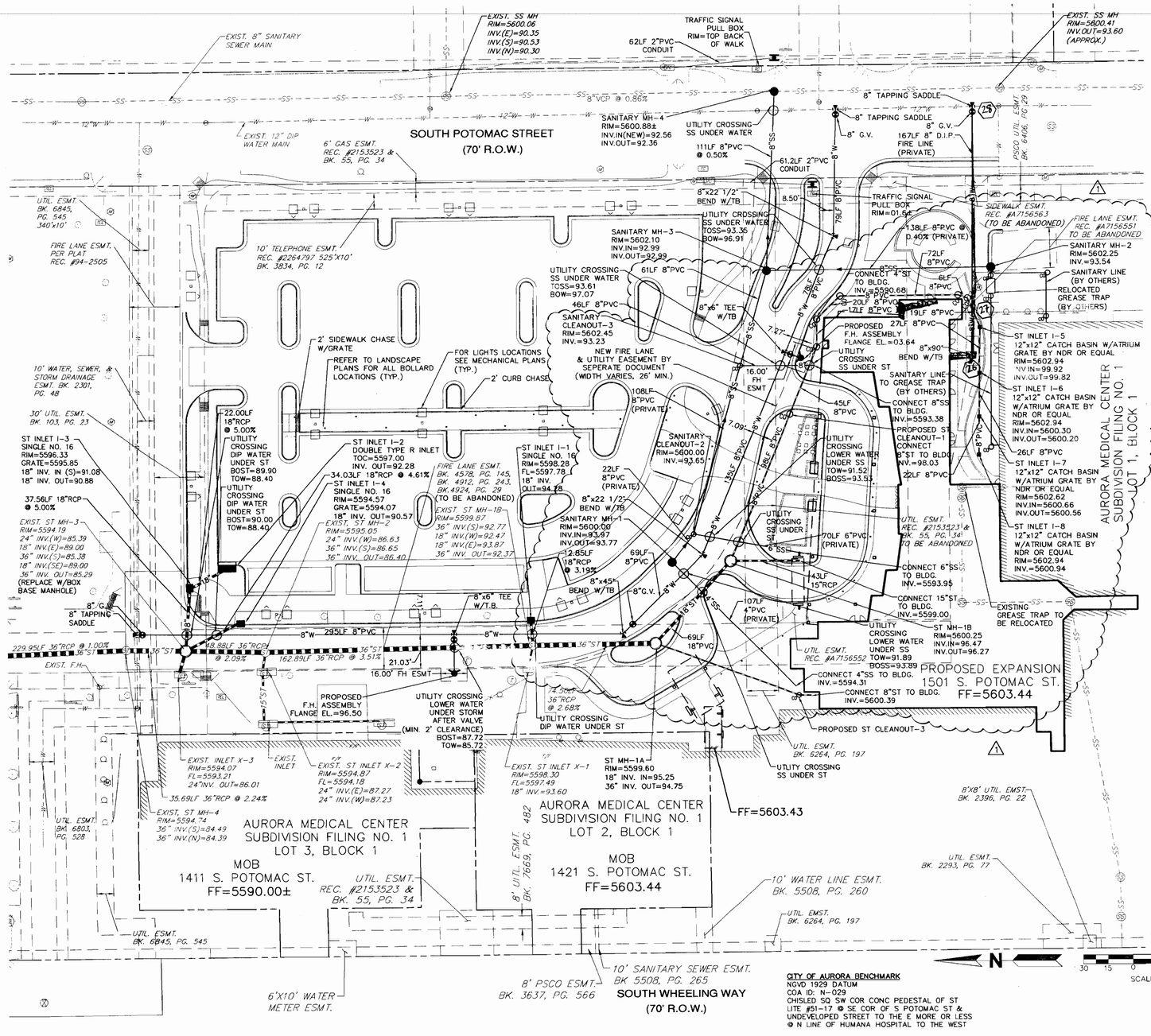
Customer Service:
(800) 882-5543
Fax 708-339-1806

GENERAL NOTES

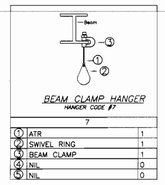
1) INSTALLATION AS PER NFPA #13 2002 AND THE AURORA FIRE DEPARTMENT AND THE AURORA BUILDING DEPARTMENT.
2) 2 1/2" AND LARGER PIPE ARE TO BE DYNA FLOW SCHEDULE 10 WITH GROOVED FITTINGS AND WELDED OUTLETS.
3) 1" THRU 2" PIPING TO BE DYNA THREAD SCH. 40 WITH SCREWED CAST IRON FITTINGS.
4) ALL EQUIPMENT TO BE U/L LISTED.
5) PIPE HANGERS SHALL BE IN ACCORDANCE WITH NFPA #13.
6) HANGER SPACING AND ROD DIAMETER SHALL BE IN ACCORDANCE WITH NFPA #13 AS FOLLOWS:
   1" THRU 2" PIPE 3/8" ROD (MAX HANGER SPACING 12')
   2" THRU 4" PIPE 3/8" ROD (MAX HANGER SPACING 15')
   5" THRU 8" PIPE 1/2" ROD (MAX HANGER SPACING 15')
7) ARCHITECT TO VERIFY THAT ELEVATOR SHAFT AND FLUIDS ARE NONCOMBUSTIBLE
8) STRUCTURAL PENETRATIONS IF REQUIRED ARE BY OTHERS AND MUST BE REVIEWED WITH STRUCTURAL ENGINEER.
9) FUTURE 6TH & 7TH FLOOR HAVE BEEN CONSIDERED IN CALCS

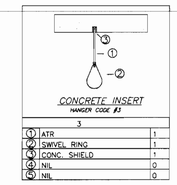
EXCLUSIONS

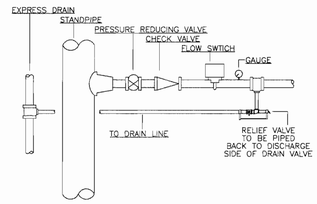
1) PAINTING OF PIPE BY OTHERS.
2) PIPE IDENTIFICATION OTHER THAN REQUIRED BY NFPA IS BY OTHERS.
3) UNDERGROUND PIPING, FLUSHING, AND TESTING BY OTHERS.
4) FREEZING PROTECTION IS OWNER'S RESPONSIBILITY.
5) CENTRAL STATION SUPERVISION (IF REQUIRED) IS BY OTHERS.
6) ALL ELECTRICAL WIRING BY OTHERS.
7) BUILDING STRUCTURAL REINFORCEMENT AS REQUIRED TO SUPPORT SPRINKLER PIPING BY OTHERS.
8) SPECIAL PROVISIONS FOR TESTING AND DISPOSAL OF TEST WATER IS EXCLUDED.



CITY OF AURORA BENCHMARK
NGVD 1929 DATUM
COA ID: N-029
CHISLED SQ SW COR CONC PEDESTAL OF ST LITE #51-17 @ SE COR OF S POTOMAC ST & UNDEVELOPED STREET TO THE E MORE OR LESS @ N LINE OF HUMANA HOSPITAL TO THE WEST







FLOOR CONTROL ASSEMBLY
N.T.S.

FLOW TEST

PROVIDED BY AURORA WATER ON 1/17/2007
TAKEN AT SITE.

	10% REDUCTION IN HYDRAULIC CALCS
S = 58.7 PSI	S = 52.83 PSI
R = 35.3 PSI	R = 31.77 PSI
F = 1500 GPM	

DRY SYSTEM CAPACITIES

DRIVE CANOPY (SHEET 3/4 OF 8) = 82 gals
PREACTION (SHEET 3/4 OF 8) = 14.2 gals

Important : In the event that a concealed space is not shown on the plan submittal and is discovered in the field, the installing contractor must defer to NFPA 13 2002, Section 8.14.

City of Aurora Building Division plan review does not grant approval for any violations of adopted Fire Code. Code violations uncovered in the field inpections must be corrected.

AURORA BUILDING CODE DIVISION
LIFE SAFETY SYSTEMS - **APPROVED**
Subject to corrections as indicated and field inspections with functional tests.
Sign _____ Date 1-3-07

1/4/07

No.	DATE	REVISION DESCRIPTION
1	1/4/07	PER CITY COMMENTS

SPRINKLER SCHEDULE & LEGEND

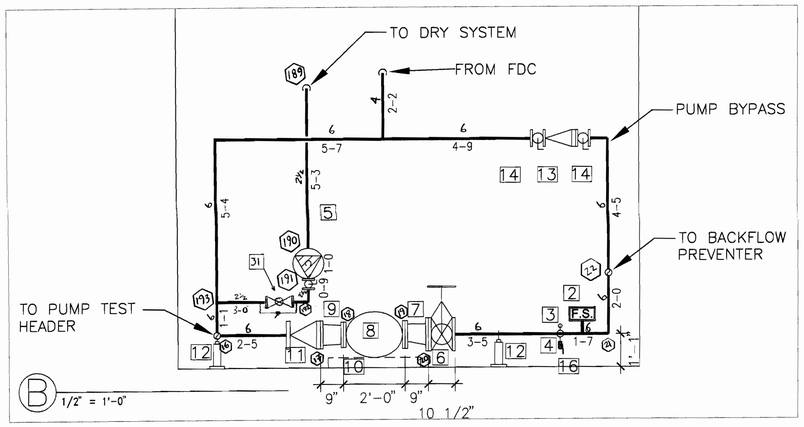
SYMBOL	SPRINKLER DESCRIPTION	ORIFICE	"K"	TEMP	FINISH	SPACING	QTY
	TYCO-TYFRB-CHROME-PENDENT	1/2"	5.6	155	WHITE		
	TYCO-TYFRB-UPRIGHT	1/2"	5.6	200	BRASS		
	TYCO-TYFRB-HSW	1/2"	5.6	286	BRASS		
	TYCO-TYFRB-SIDEWALL	1/2"	5.6	155	BRASS		
	TYCO-TYFRB-UPRIGHT	1/2"	5.6	286	BRASS		

TOTAL COUNT THIS SHEET = 0
TOTAL COUNT THIS JOB = 1168

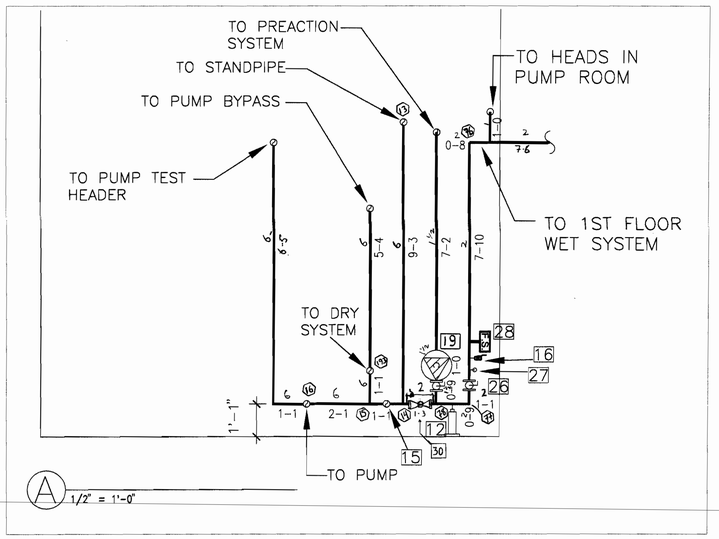
MEDICAL CENTER OF AURORA
1501 S. Potomac Street
Aurora, CO 80012

CODE FIRE, LLC
4896 Ylan Gordon Street, Wheat Ridge, CO 80033
PHONE 303-425-9698 FAX 303-425-6172

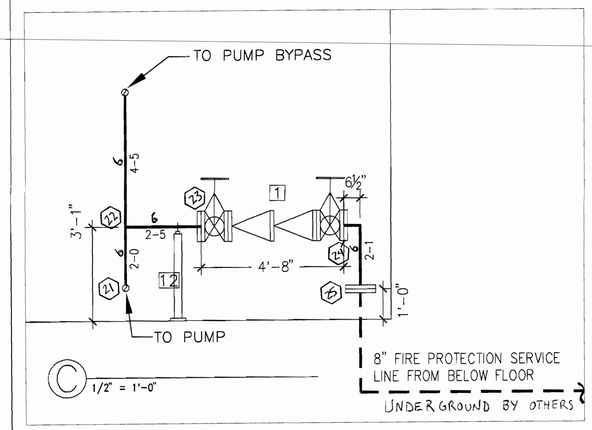
DESIGNER	DHolcombe
SCALE	1/8" = 1'-0"
CHECK BY	SDahms
	NICET 3-99320
JOB NUMBER	L07013
DATE	12/26/07
DRAWING NO.	1 of 8



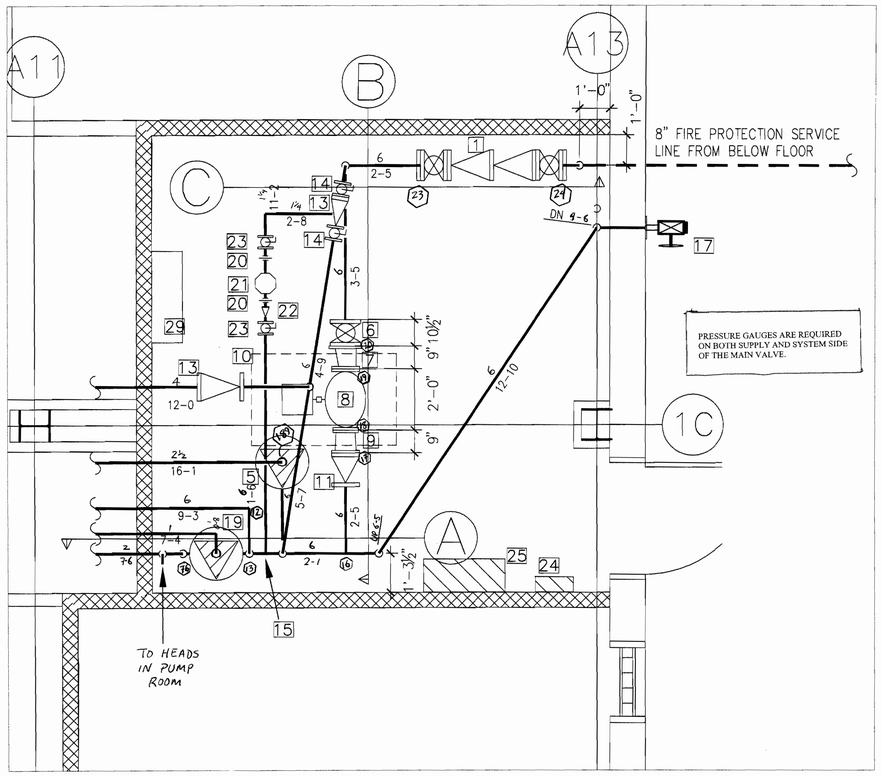
B 1/2" = 1'-0"



A 1/2" = 1'-0"



C 1/2" = 1'-0"

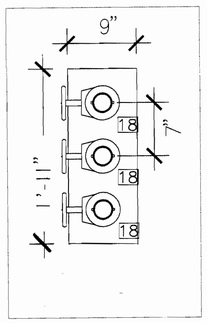


PUMP ROOM — 1st FLOOR

SCALE 1/2"=1'-0"

FIRE PUMP LEGEND

1) 6" FEBCO 850 BACKFLOW PREVENTER/ W TAMPER SWITCH
2) 6" FLOW SWITCH
3) 1/2" THREAD-O-LET FOR GAUGE
4) 1 1/4" THREAD-O-LET TO JOCKEY PUMP
5) DRY VALVE
6) OS&Y VALVE/TAMPER SWITCH
7) 6" X 5 " ECCENTRIC REDUCER
8) FIRE PUMP 750 GPM @ 135 PSI FIRE PUMP
9) 6" X 4 " CONCENTRIC REDUCER
10) 4" THICK EQUIPMENT PAD 3' X 4'-9" – BY OTHERS
11) 6" FLANGED CHECK VALVE
12) 6" PIPE STAND
13) 6" GROOVED CHECK VALVE
14) 6" NIBCO BUTTERFLY VALVE/TAMPER
15) 1 1/4" COUPLING OUTLET TO JOCKEY PUMP
16) MAIN DRAIN 2"
17) PUMP TEST HEADER – SEE DETAIL #17
18) 2 1/2" HOSE VALVE/ CAPS AND CHAINS – SEE DETAIL #17
19) PREACTION VALVE
20) 1 1/4" UNION
21) 3 H.P. JOCKEY PUMP
22) 1 1/4" CHECK VALVE
23) 1 1/4" MILWAUKEE BUTTERBALL VALVE/ TAMPER
24) METRON JOCKEY PUMP CONTROLLER
25) METRON FIRE PUMP CONTROLLER
26) 4" BUTTERFLY VALVE
27) 4" GAUGE
28) 4" FLOW SWITCH
29) 7½ H.P. GENERAL COMPRESSOR # LT20033
30) 2" PRESSURE REDUCING VALVE WITH RELIEF VALVE
31) 2½" PRESSURE REDUCING VALVE WITH RELIEF VALVE



17 PUMP TEST HEADER
NTS

HYDRAULIC — SYSTEM

This building is protected by a Hydraulically Designed Automatic Sprinkler System.

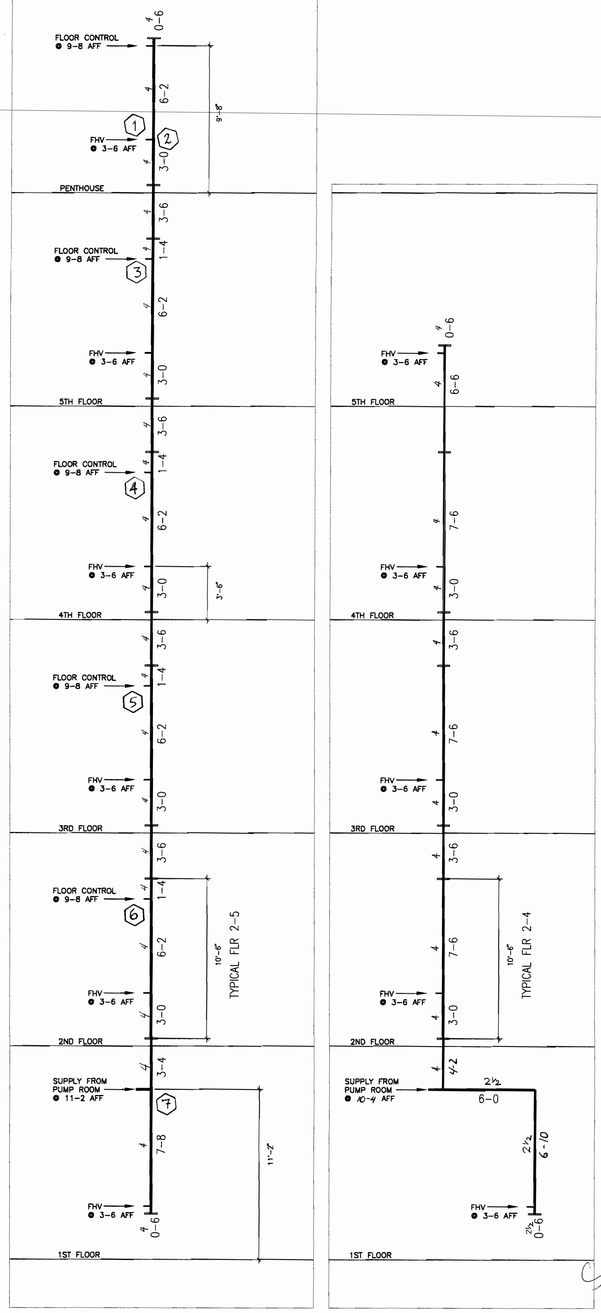
Location: Remote area #1

No. of Sprinklers:

Basis of Design
1. DENSITY: .STANDPIPE GPM/SQ. FT.
2. DESIGNED AREA OF DISCHARGE: SQ. FT.

System Demand
1. GPM DISCHARGE: 500 GPM
2. RESIDUAL PRESSURE AT THE BASE OF THE RISER: 161.71 PSI

CODE Fire Systems Inc.
Wheatridge, CO (303) 425-0133



STAIR #1
1/4" = 1'-0"

STAIR #2
1/4" = 1'-0"

No.	DATE	REVISION DESCRIPTION

SPRINKLER SCHEDULE & LEGEND

SYMBOL	SPRINKLER DESCRIPTION	ORIFICE	"K"	TEMP	FINISH	SPARE	QTY.
	TYCO-TYFRB-CHROME-PENDENT	1/2"	5.6	155	WHITE		
	TYCO-TYFRB-UPRIGHT	1/2"	5.6	200	BRASS		
	TYCO-TYFRB-CHROME	1/2"	5.6	286	BRASS		
	TYCO-TYFRB-UPRIGHT	1/2"	5.6	155	BRASS		
	TYCO-TYFRB-UPRIGHT	1/2"	5.6	286	BRASS		

TOTAL COUNT THIS SHEET = 0
TOTAL COUNT THIS JOB = 1900

MEDICAL CENTER OF AURORA
1501 S. Potomac Street
Aurora, CO 80012

CODE FIRE, LLC

4896 Van Gordon Street, Wheat Ridge, CO 80033
PHONE 303-425-0898 FAX 303-425-6122

DESIGNER	dHOLCOMBE
SCALE	
CHECK BY	sDAHMS NICET 3-99320
JOB NUMBER	L07013
DATE	12/26/07
DRAWING NO.	2 of 8

NOTES

1) ALL CEILINGS 9-0 AFF U.N.O.
2) ALL HEADS IN ELECTRICAL ROOMS TO BE 200 DEGREE HEADS

HYDRAULIC — SYSTEM
This building is protected by a Hydraulically Designed Automatic Sprinkler System.
Location: Remote Area #3
No. of Sprinklers: 13
Basis of Design
1. DENSITY: 0.1 GPM/SQ. FT.
2. DESIGNED AREA OF DISCHARGE: 1350 SQ. FT.
System Demand
1. GPM DISCHARGE: 307.55 GPM
2. RESIDUAL PRESSURE AT THE BASE OF THE RISER: 152.00 PSI
CODE Fire Systems Inc. Wheatridge, CO (303) 425-0688

HYDRAULIC — SYSTEM
This building is protected by a Hydraulically Designed Automatic Sprinkler System.
Location: Remote Area #4
No. of Sprinklers: 8
Basis of Design
1. DENSITY: 0.1 GPM/SQ. FT.
2. DESIGNED AREA OF DISCHARGE: 900 SQ. FT.
System Demand
1. GPM DISCHARGE: 145.44 GPM
2. RESIDUAL PRESSURE AT THE BASE OF THE RISER: 126.79 PSI
CODE Fire Systems Inc. Wheatridge, CO (303) 425-0688

HYDRAULIC — SYSTEM
This building is protected by a Hydraulically Designed Automatic Sprinkler System.
Location: REMOTE AREA #5
No. of Sprinklers: 7
Basis of Design
1. DENSITY: 0.1 GPM/SQ. FT.
2. DESIGNED AREA OF DISCHARGE: 945 SQ. FT.
System Demand
1. GPM DISCHARGE: 143.03 GPM
2. RESIDUAL PRESSURE AT THE BASE OF THE RISER: 87.26 PSI
CODE Fire Systems Inc. Wheatridge, CO (303) 425-0688

1st FLOOR FIRE SPRINKLER PLAN AREA A
SCALE 1/8"=1'-0"

UNDERGROUND TO FIRE PUMP ROOM
SCALE 1/8"=1'-0"

SPRINKLER SCHEDULE & LEGEND

SYMBOL	SPRINKLER DESCRIPTION	ORIFICE	"K"	TEMP	FINISH	SPACING	QTY.
⊠	TYCO-TYFRB-CHROME-PENDENT	1/2"	5.6	155	WHITE	12'x	285
⊘	TYCO-TYFRB-UPRIGHT	1/2"	5.6	200	BRASS	12'x	10
▽	TYCO-TYFRB-HSW	1/2"	5.6	286	BRASS	12'x	4
◎	TYCO-TYFRB-CHROME-UPRIGHT	1/2"	5.6	155	BRASS	12'x	4
◎	TYCO-TYFRB-UPRIGHT	1/2"	5.6	286	BRASS	12'x	0
●	TYCO-DS1-DRY-CHROME-PENDENT	1/2"	5.6	155	CHROME	12'x	42

TOTAL COUNT THIS SHEET = 285
TOTAL COUNT THIS JOB = 1713

No.	DATE	REVISION DESCRIPTION

MEDICAL CENTER OF AURORA
1501 S. Potomac Street, Aurora, CO 80012

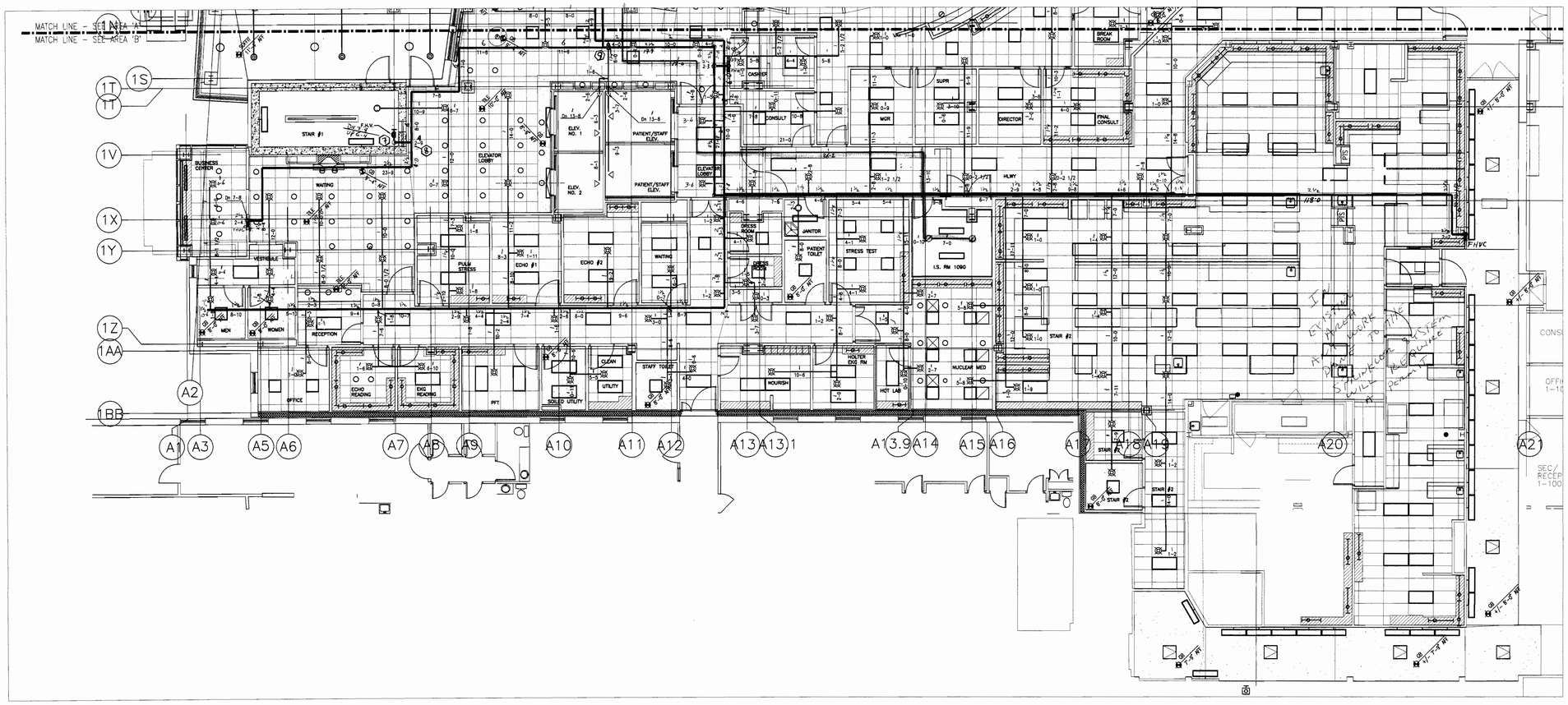
CODE FIRE, LLC

4896 Van Gordon Street, Wheat Ridge, CO 80033
PHONE 303-425-0698 FAX 303-425-6127

DESIGNER	dHOLCOMBE
SCALE	1/8" = 1'-0"
CHECK BY	SDAHMS
	NICET 3-99320
JOB NUMBER	L07013
DATE	12/26/07
DRAWING NO.	3 of 8

NOTES

1) ALL CEILINGS 9-0 AFF U.N.O.
2) ALL HEADS IN ELECTRICAL ROOMS TO BE 200 DEGREE HEADS



1st FLOOR FIRE SPRINKLER PLAN AREA B

SCALE 1/8"=1'-0"

No.	DATE	REVISION DESCRIPTION

SPRINKLER SCHEDULE & LEGEND

SYMBOL	SPRINKLER DESCRIPTION	ORIFICE	K"	TEMP	FINISH	SPACING	QTY
	TYCO-TYFRB-CHROME-PENDENT	1/2"	5.6	155	WHITE		
	TYCO-TYFRB-UPRIGHT	1/2"	5.6	200	BRASS		
	TYCO-TYFRB-HSW	1/2"	5.6	286	BRASS		
	TYCO-TYFRB-SIDEWALL	1/2"	5.6	155	BRASS		
	TYCO-TYFRB-UPRIGHT	1/2"	5.6	286	BRASS		
	TYCO-DS1-DRY-CHROME-PENDENT	1/2"	5.6	155	CHROME		

TOTAL COUNT THIS SHEET =
TOTAL COUNT THIS JOB =

See Sheet # 3 of 8

MEDICAL CENTER OF AURORA
1501 S. Potomac Street
Aurora, CO 80012

CODE FIRE, LLC

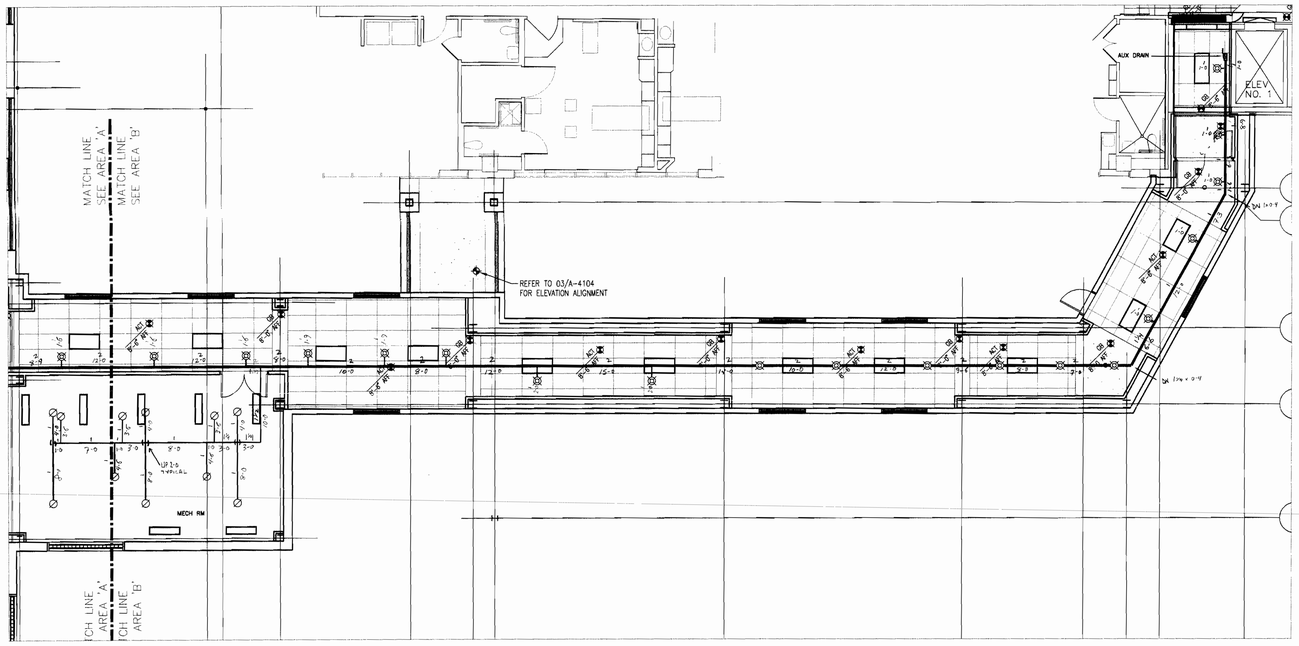
4896 Van Gordon Street, Wheat Ridge, CO 80033
PHONE 303-425-0698
FAX 303-425-6127

DESIGNER	dHOLCOMBE
SCALE	1/8" = 1'-0"
CHECK BY	sDAHMS
	NICET 3-99320
JOB NUMBER	L07013
DATE	12/26/07
DRAWING NO.	4 of 8

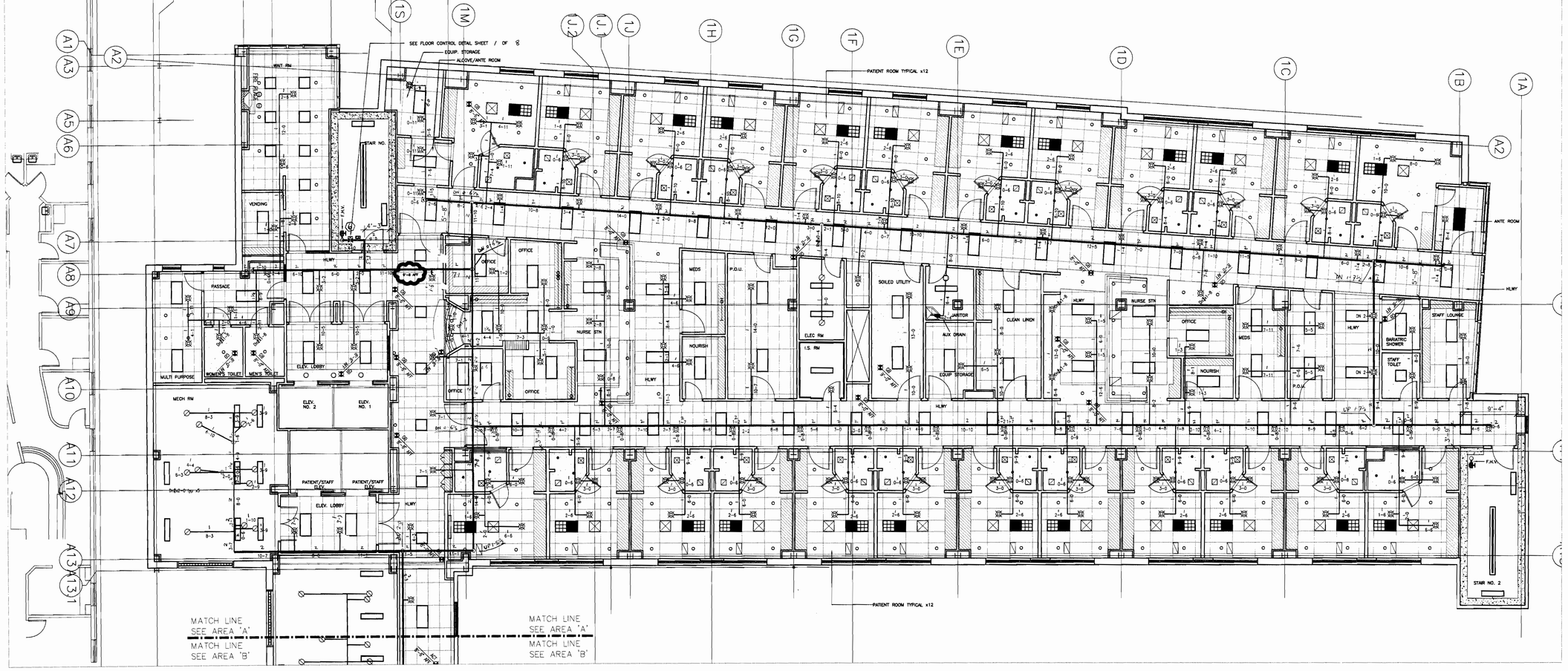
Scott Dahms NICET 3-99320 12/26/07

NOTES

1) ALL CEILINGS 9'-0 AFF U.N.O.
2) ALL HEADS IN ELECTRICAL AND MECHANICAL ROOMS TO BE 200° HEADS



2nd FLOOR FIRE SPRINKLER PLAN AREA B
SCALE 1/8"=1'-0"



2nd FLOOR FIRE SPRINKLER PLAN AREA A
SCALE 1/8"=1'-0"

SPRINKLER SCHEDULE & LEGEND

SYMBOL	SPRINKLER DESCRIPTION	ORIFICE	"K"	TEMP	FINISH	QTY.
⊠	TYCO-TYFRB-CHROME-PENDENT	1/2"	5.6	155	WHITE	192
⊗	TYCO-TYFRB-UPRIGHT	1/2"	5.6	200	BRASS	24
○	TYCO-TYFRB-UPRIGHT	1/2"	5.6	155	BRASS	1

TOTAL COUNT THIS SHEET = 217
TOTAL COUNT THIS JOB = 1165

No.	DATE	REVISION DESCRIPTION

MEDICAL CENTER OF AURORA
1501 S. Potomac Street
Aurora, CO 80012

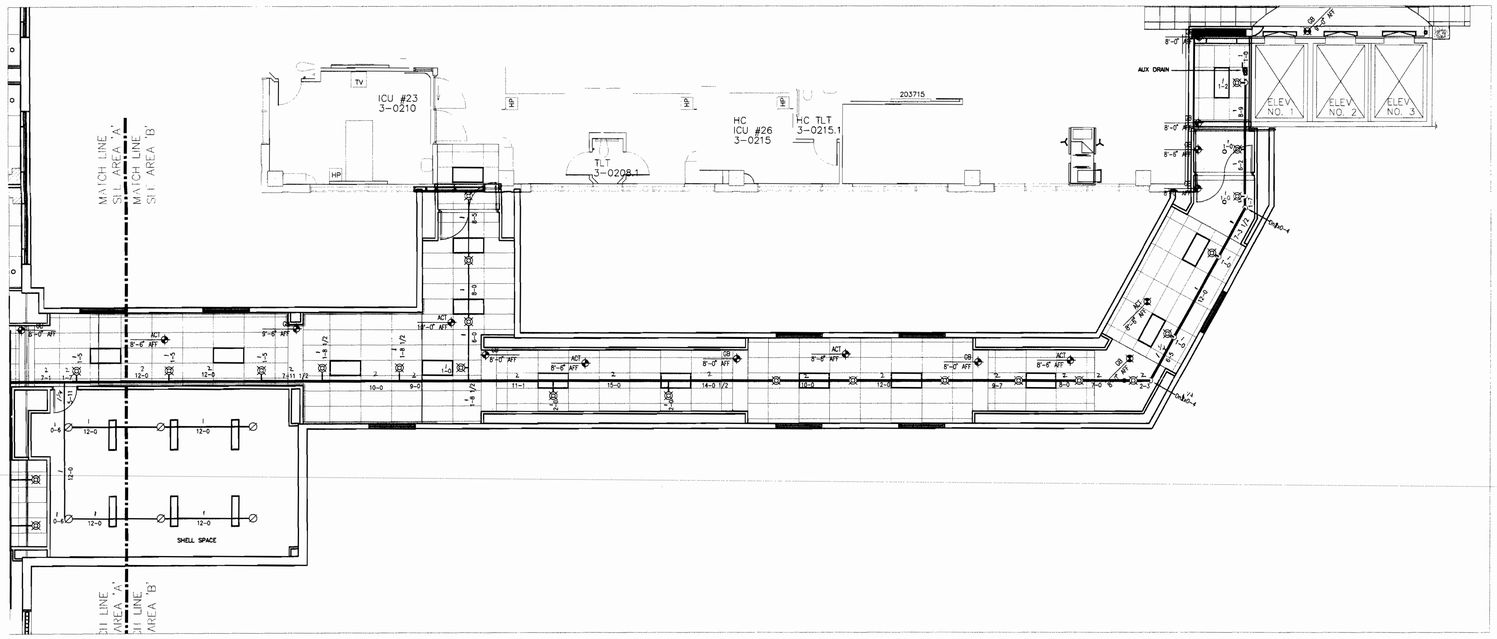
CODE FIRE, LLC

4808 Van Gordon Street, Wheat Ridge, CO 80033
PHONE 303-422-0998 FAX 303-422-0127

DESIGNER	dHOLCOMBE
SCALE	1/8" = 1'-0"
CHECK BY	sDAHMS
	NICET 3-99320
JOB NUMBER	L07013
DATE	12/26/17
DRAWING NO.	5 of 8

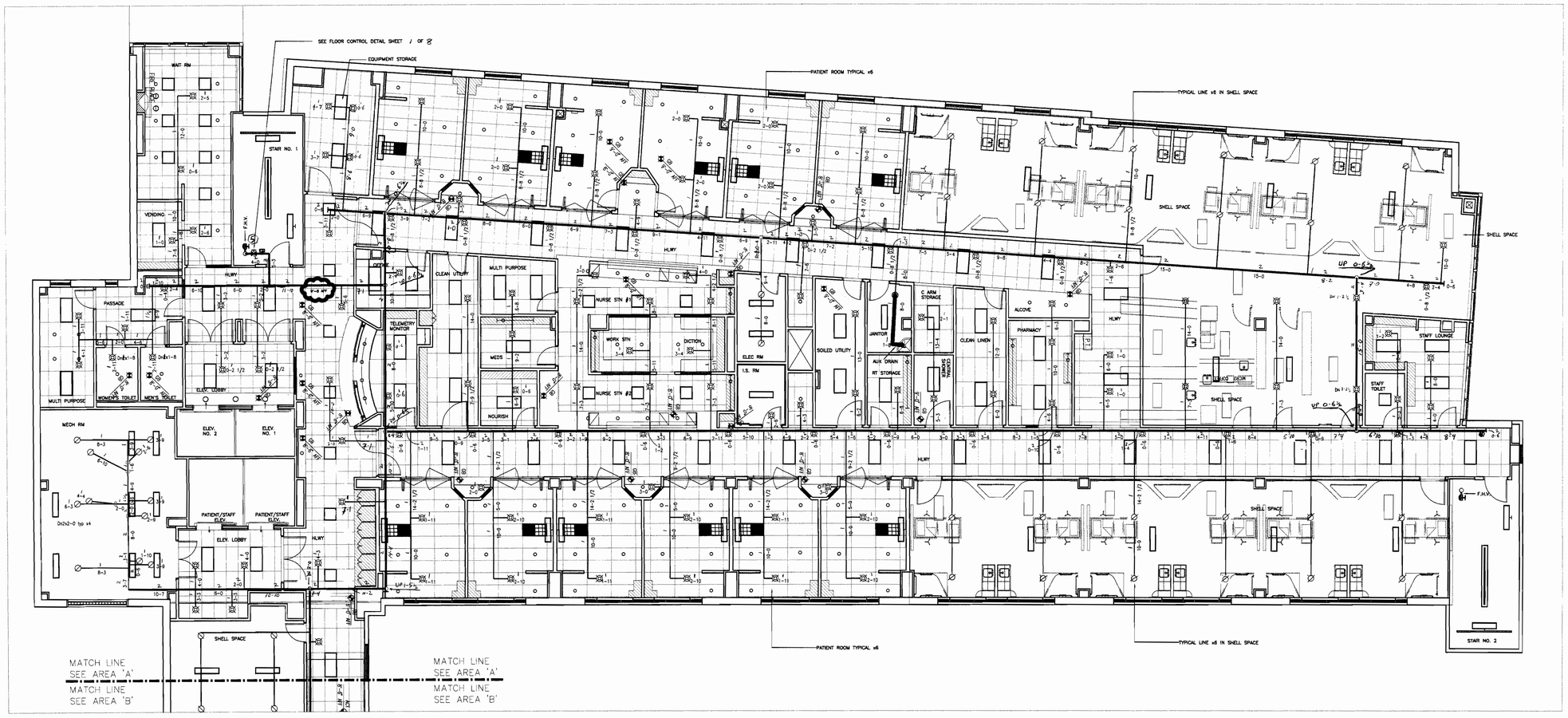
NOTES

1) ALL CEILINGS 9-0 AFF U.N.O.
2) ALL HEADS IN ELECTRICAL AND MECHANICAL ROOMS TO BE 200° HEADS



3rd FLOOR FIRE SPRINKLER PLAN AREA B

SCALE 1/8" = 1'-0"



3rd FLOOR FIRE SPRINKLER PLAN AREA A

SCALE 1/8" = 1'-0"

SPRINKLER SCHEDULE & LEGEND

SYMBOL	SPRINKLER DESCRIPTION	ORIFICE	"K"	TEMP	FINISH	SPACING	QTY
	TYCO-TYFRB-CHROME-PENDENT	1/2"	5.6	155	WHITE		1170
	TYCO-TYFRB-UPRIGHT	1/2"	5.6	200	BRASS		19
	TYCO-TYFRB-UPRIGHT	1/2"	5.6	155	BRASS		1

TOTAL COUNT THIS SHEET = 190
TOTAL COUNT THIS JOB = 1069

No.	DATE	REVISION DESCRIPTION

MEDICAL CENTER OF AURORA
1501 S. Potomac Street
Aurora, CO 80012

CODE FIRE, LLC

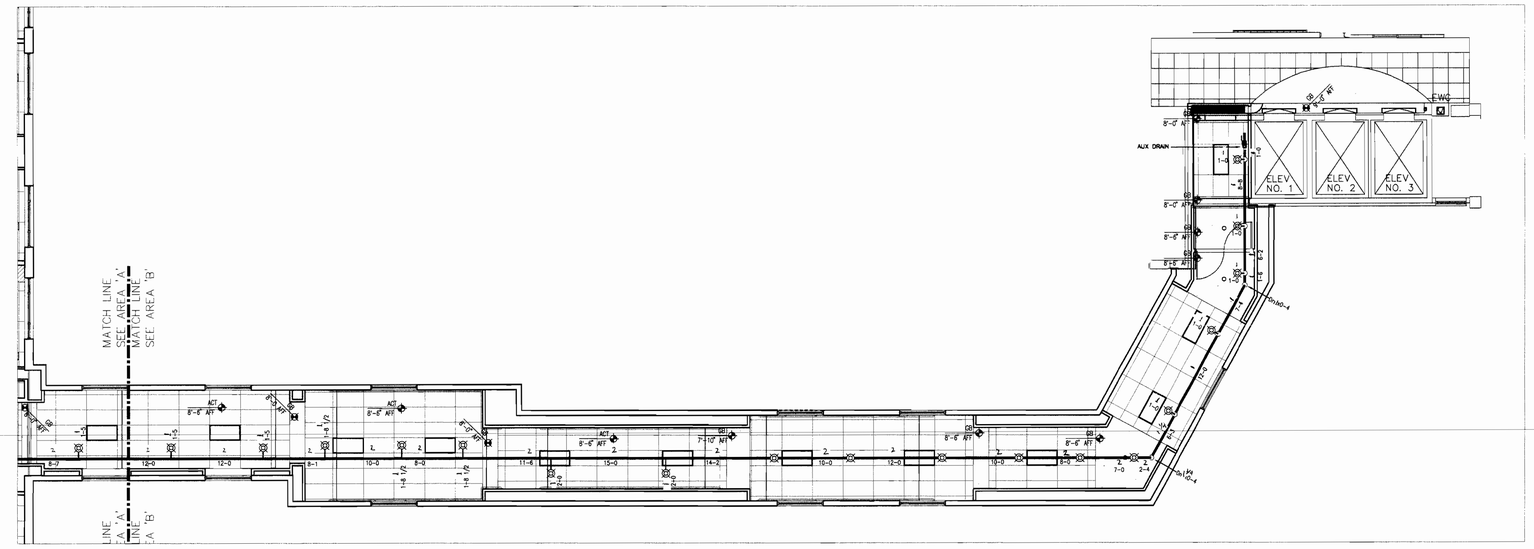
4696 Van Gordon Street, Wheat Ridge, CO 80033
PHONE 303-425-0698 FAX 303-425-6127

DESIGNER	dHOLCOMBE
SCALE	1/8" = 1'-0"
CHECK BY	sDAHMS
	NICET 3-99320
JOB NUMBER	L07013
DATE	12/26/07
DRAWING NO.	6 of 8

Scott J. Dahms
Nicet 3-99320
12/26/07

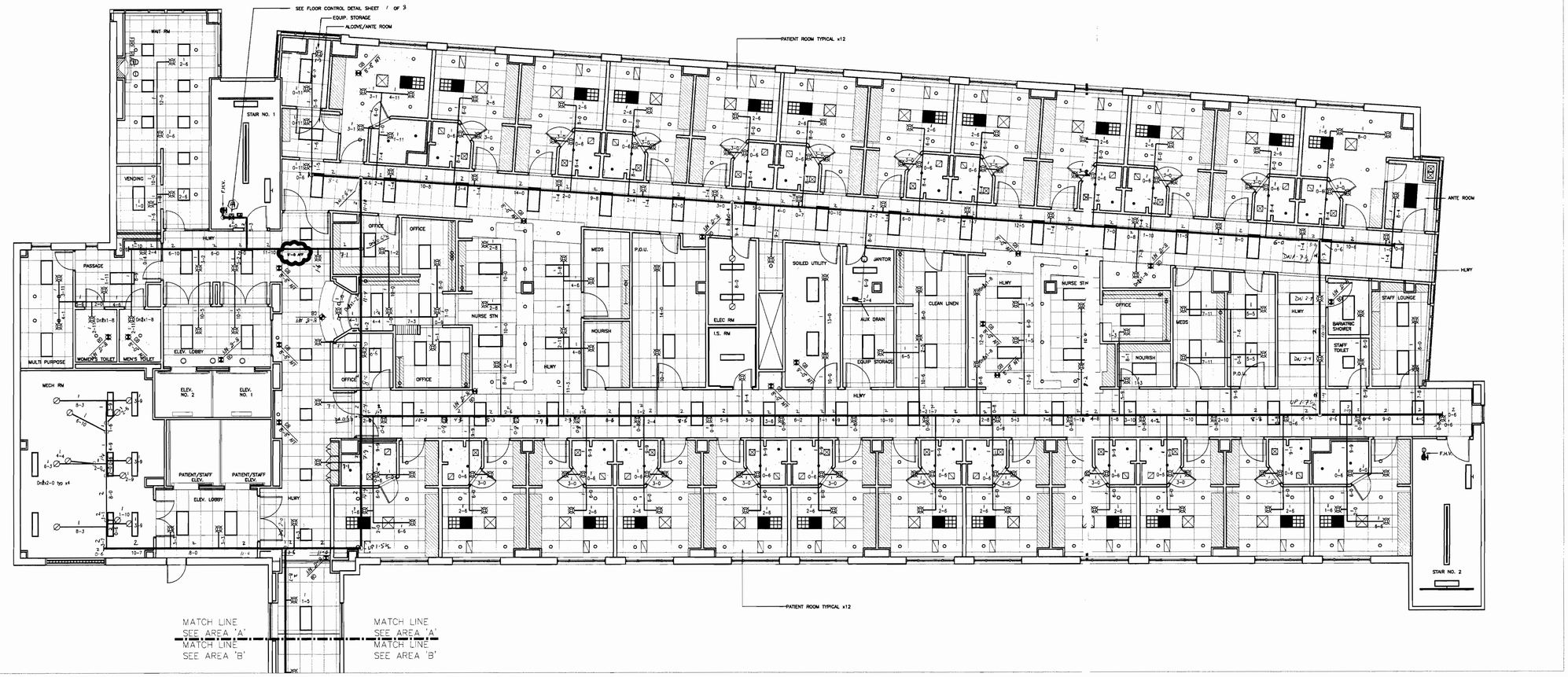
NOTES

1) ALL CEILINGS 9-0 AFF U.N.O.
2) ALL HEADS IN ELECTRICAL AND MECHANICAL ROOMS TO BE 200° HEADS



4th FLOOR FIRE SPRINKLER PLAN AREA B

SCALE 1/8" = 1'-0"



4th FLOOR FIRE SPRINKLER PLAN AREA A

SCALE 1/8" = 1'-0"

SPRINKLER SCHEDULE & LEGEND

SYMBOL	SPRINKLER TYPE	TEMP	ORIFICE	SPACING	QTY
⊠	TYCO-TYFRB-CHROME-PENDENT	155	5.6	12'	1.92
⊠	TYCO-TYFRB-UPRIGHT	200	5.6	12'	1.3
○	TYCO-TYFRB-UPRIGHT	155	5.6	12'	1

No.	DATE	REVISION DESCRIPTION

TOTAL COUNT THIS SHEET = 1206
TOTAL COUNT THIS JOB = 8779

MEDICAL CENTER OF AURORA
1501 S. Potomac Street
Aurora, CO 80012

CODE FIRE, LLC

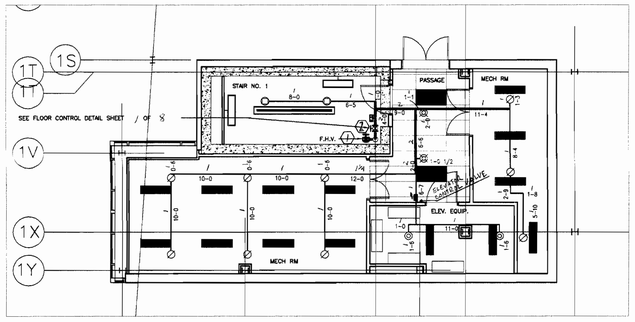
4896 Van Gordon Street, Wheat Ridge, CO 80033
PHONE: 303-420-2999 FAX: 303-425-5227

DESIGNER	dHOLCOMBE
SCALE	1/8" = 1'-0"
CHECK BY	sDAHMS
	NICET 3-99320
JOB NUMBER	L07013
DATE	12/26/17
DRAWING NO.	7 of 8

Scott Dahms NICET 3 99320 12/26/17

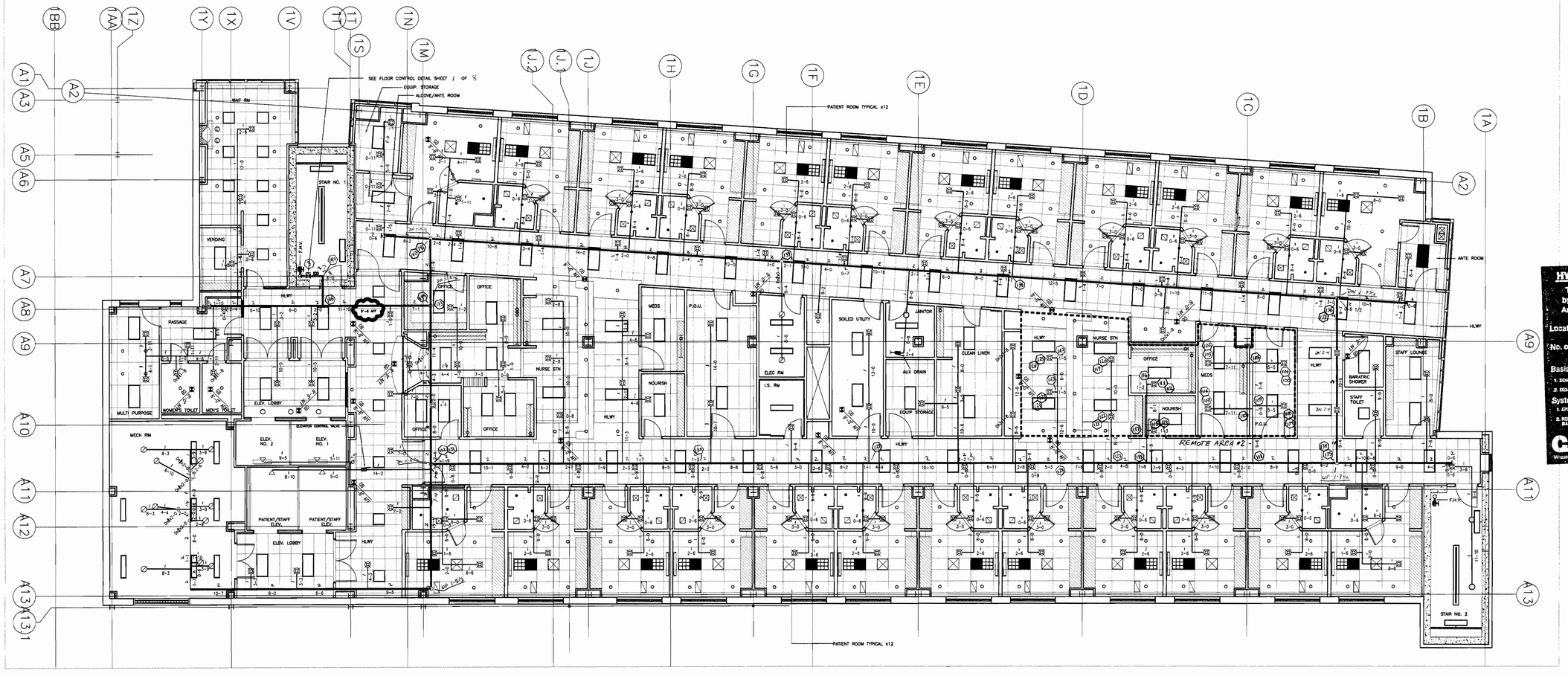
NOTES

1) ALL CEILINGS 9-0 AFF U.N.O.
2) ALL HEADS ELECTRICAL AND MECHANICAL ROOMS TO BE Zoo° HEADS



6th FLOOR FIRE SPRINKLER PLAN

SCALE 1/8" = 1'-0"



HYDRAULIC — SYSTEM

This building is protected by a Hydraulically Designed Automatic Sprinkler System.

Location: Remote Area #2

No. of Sprinklers: 10

Basis of Design
1. DENSITY: 0.1 GPM/SQ. FT.
2. DESIGNED AREA OF DISCHARGE: 700 SQ. FT.

System Demand
1. GPM DISCHARGE: 289.69 GPM
2. RESIDUAL PRESSURE AT THE BASE OF THE RISER: 162.90 PSI

CODE Fire Systems Inc. Wheatridge, CO (303) 425-6033

5th FLOOR FIRE SPRINKLER PLAN

SCALE 1/8" = 1'-0"

No.	DATE	REVISION DESCRIPTION

SPRINKLER SCHEDULE & LEGEND

SYMBOL	SPRINKLER DESCRIPTION	ORIFICE "K"	TEMP	FINISH	SPACING	QTY.
⊠	TYCO-TYFRB-CHROME-PENDENT	1/2" 5.6	155	WHITE	175	208
◇	TYCO-TYFRB-UPRIGHT	1/2" 5.6	200	BRASS	22	4
▽	TYCO-TYFRB-HSW	1/2" 5.6	286	BRASS		5
○	TYCO-TYFRB-SIDEWALL	1/2" 5.6	135	BRASS		2
◎	TYCO-TYFRB-UPRIGHT	1/2" 5.6	286	BRASS		

TOTAL COUNT THIS SHEET = 208
TOTAL COUNT THIS JOB = 1777

MEDICAL CENTER OF AURORA
1501 S. Potomac Street
Aurora, CO 80012

CODE FIRE, LLC

4896 Van Gordon Street, Wheat Ridge, CO 80033
PHONE 303-425-6037 FAX 303-425-6038

DESIGNER	dHOLCOMBE
SCALE	1/8" = 1'-0"
CHECK BY	sDAHMS NICET 3-99320
JOB NUMBER	L07013
DATE	12/26/07
DRAWING NO.	8 of 8

Scott Dahms NICET 3-99320 12/26/07

City of Aurora Plan Review
Project: MEDICAL CENTER A-mart
Contractor: CODE FIRE
Address: 1501 S. POTOMAC
RSN: 235237
Date: 1-3-07

City of Aurora Plan Review
Occ. Type: I-2
Const. Type: 1A SPR
Square Footage: 128,251
Code: 2006 IFC 2002 NFPA 13 H

Permit No. 07-20924
Microfilmed Date
Purged Date

CAB 24

FIRE SPRINKLER