

INSTRUMENTATION PIPING ARRANGEMENTS AT ORIFICE PLATES

C			IRANIAN PETROLEUM STANDARDS 								
B			NO REVISION PERMITTED UNLESS APPROVED BY STANDARD ORGANIZATION								
A			PIPING ARRANGEMENTS AT ORIFICE PLATES								
REV	DESCRIPTION	DATE	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; text-align: center;">DATE</td> <td style="width: 40%; text-align: center;">DRAWING No.</td> <td style="width: 15%; text-align: center;">SHT</td> <td style="width: 20%; text-align: center;">REV.</td> </tr> <tr> <td></td> <td style="text-align: center;">IPS - D - IN - 102</td> <td style="text-align: center;">1</td> <td style="text-align: center;">5</td> </tr> </table>	DATE	DRAWING No.	SHT	REV.		IPS - D - IN - 102	1	5
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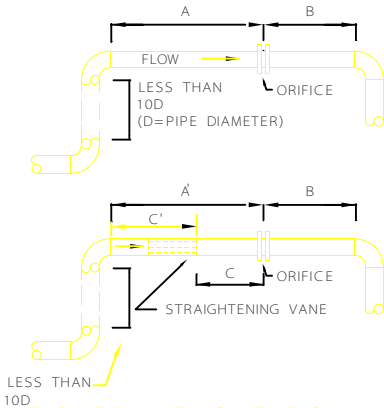


FIGURE.1 TWO ELBOW IN SAME PLANE

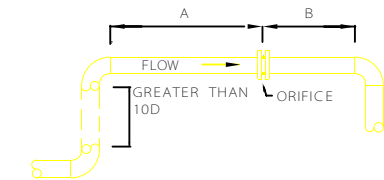


FIGURE.2 TWO ELBOW IN SAME PLANE

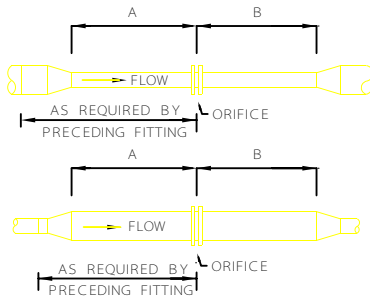


FIGURE.3 REDUCER AND EXPANDER

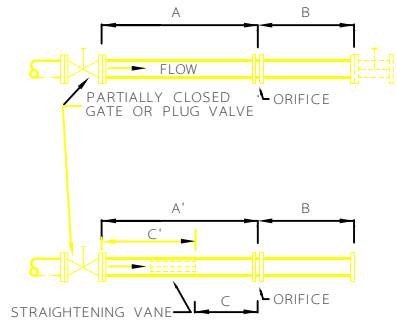
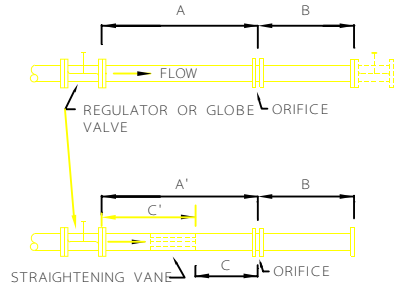


FIGURE.4 VALVE

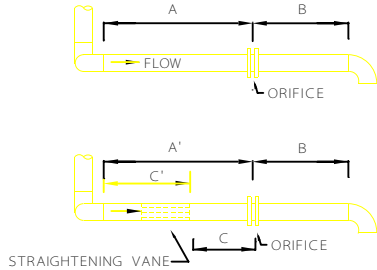


FIGURE.5 TWO ELBOWS IN DIFFERENT PLANES

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PIPING ARRANGEMENTS AT ORIFICE PLATES

TABLE-1 MINIMUM METER TUBE LENGTHS IN TERMS OF PIPE DIAMETERS AND BETA RATIO
USE FOR ALL PIPE SIZES

INSTALLATION FIGURE	DIMENSION	BETA RATIO				
		.5	.6	.67	.70	.75
1	A	10.1	13.7	17.4	18.9	21.5
	A'	9.2	10.3	11.7	12.0	13.5
	B	3.7	4.0	4.2	4.3	4.5
	C	5.1	5.6	6.2	6.4	7.1
2	C'	4.1	4.7	5.5	5.6	6.4
	A	6.9	9.3	12.3	13.9	16.6
3	B	3.7	4.0	4.2	4.3	4.5
	A	7.2	9.8	11.6	12.1	13.4
4	B	3.7	4.0	4.2	4.3	4.5
	A	25.2	30.2	36.0	38.8	44.5
	A'	10.3	12.2	14.2	15.3	17.5
	C	5.0	5.5	6.2	6.3	7.0
	C'	5.3	6.7	8.0	9.0	10.5
5	A	21.0	25.0	28.8	31.3	35.3
	A'	10.0	11.3	12.8	13.5	15.0
	B	3.7	4.0	4.2	4.3	4.5
	C	5.0	5.5	6.2	6.7	7.2
	C'	5.0	5.8	6.6	7.0	7.8

* ABOVE TABLE BASED ON FLANGE TAPS. FOR PIPE TAPS ADD 2 DIAMETERS TO A, A' AND 8 PIPE DIAMETERS TO B.

NOTES:

- 1- DIMENSIONS SHOWN ARE MINIMUM REQUIREMENT WHEN POSSIBLE THEY SHOULD BE INCREASED.
- 2- ALL TABULATED DIMENSIONS ARE BASED ON THE A.G.A. REPORT NO.3 - ANSI/API 2530 SECOND EDITION , SEPTEMBER 1985, AND A MAXIMUM ORIFICE DIAMETER RATIO (d/D) OF 0.70. DIMENSIONS SHOWN ARE TO THE CENTER OR FACE OF ORIFICE PLATE.
- 3- ON THE UPSTREAM SIDE THERMOWELLS SHOULD PRECEDE THE ORIFICE BY AT LEAST 20 PIPE DIAMETERS, ON DOWNSTREAM THERMOWELLS SHOULD NOT BE LOCATED CLOSER THAN 5 PIPE DIAMETERS. IF STRAIGHTENING VANE ARE USED THERMOWELLS SHOULD BE PLACED NOT CLOSER THAN 300mm FROM THE UPSTREAM EDGE OF STRAIGHTENING VANE.
- 4- METER RUNS FOR ORIFICES SHOULD PREFERABLY BE MINIMUM 50mm(2") (FOR FLG. TAP) IN LINES SMALLER THAN 50mm(2") IT IS ADVISABLE TO SWAGE THE LINE UP TO THE 50 mm(2") SIZE.
- 5- ALL SIZES OF PIPES AND FITTINGS ARE IN INCHES AND THREADS ARE IN NPT. OTHER DIMENSIONS ARE IN mm.

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TABLE -2 MINIMUM METER TUBE LENGTH AT 0.75 BETA RATIO BY NOMINAL PIPE SIZE (USING FLANGE TAPS)]

PIPE SIZE	50mm(2")	76mm(3")	101mm(4")	152mm(6")	203mm(8")	254mm(10")	304mm(12")
FIGURE 1- TWO ELBOWS IN SAME PLANE							
A mm	1143	1677	2210	3327	4420	5486	6604
A'mm	737	1067	1397	2108	2794	3480	4166
B mm	254	356	483	711	940	1168	1397
C mm	381	559	737	1118	1473	1829	2184
C'mm	356	508	660	991	1321	1651	1981
FIGURE 2- TWO ELBOWS IN SAME PLANE							
A mm	889	1295	1702	2565	3404	4242	5105
B mm	254	356	483	711	940	1168	1397
FIGURE 3 - REDUCER							
A mm	711	1067	1372	2083	2769	3429	4115
B mm	254	356	483	711	940	1168	1397
FIGURE 4 - VALVE OR REGULATOR							
A mm	2337	3480	4572	6858	9144	11328	13665
A'mm	940	1397	1829	2718	3607	4496	5385
B mm	254	356	483	711	940	1168	1397
C mm	381	559	737	1092	1448	1803	2159
C'mm	559	838	1092	1626	2159	2692	3226
FIGURE 5- TWO ELBOWS IN DIFFERENT PLANE							
A mm	1854	2769	3632	5461	7239	8992	10846
A'mm	813	1194	1549	2337	3099	3861	4623
B mm	254	356	483	711	940	1168	1397
C mm	381	584	737	1118	1499	1854	2210
C'mm	432	610	813	1219	1600	2007	2413

NOTE 1:WHEN PIPE TAPS ARE USED,A,A', AND C SHOULD BE INCREASED BY TWO PIPE DIAMETERS AND B BY EIGHT PIPE DIAMETERS.

NOTE 2:WHEN, IN FIGURE 5, THE TWO ELBOWS ARE CLOSELY (LESS THAN 3D) PRECEDED BY A THIRD ELBOW WHICH IS NOT IN THE SAME PLANE AS THE MIDDLE OR SECOND ELBOW ,THE PIPING REQUIREMENTS SHOWN BY "A" SHOULD BE DOUBLED.

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TABLE - 2 (CONTINUED)

PIPE SIZE	356mm(14")	406mm(16")	457mm(18")	508mm(20")	610mm(24")	660mm(26")	762mm(30")
FIGURE 1- TWO ELBOWS IN SAME PLANE							
A mm	7645	8738	9830	10992	13106	14199	16383
A'mm	4826	5512	6198	6858	8255	8941	10287
B mm	1600	1829	2057	2286	2743	2972	3429
C mm	2540	2896	3251	3607	4343	4699	5410
C'mm	2286	2616	2946	3251	3912	4242	4877
FIGURE 2 - TWO ELBOWS IN SAME PLANE							
A mm	5918	6756	7595	8433	10135	10973	12649
B mm	1600	1829	2057	2286	2743	2972	3429
FIGURE 3 -REDUCER							
A mm	4775	5461	6147	6807	8179	8865	10211
B mm	1600	1829	2057	2286	2743	2972	3429
FIGURE 4- VALVE OR REGULATOR							
A mm	15824	18085	20345	22606	27127	29388	33909
A'mm	6223	7112	8001	8890	10668	11557	13335
B mm	1600	1829	2057	2286	2743	2972	3429
C mm	2489	2845	3200	3556	4267	4623	5334
C'mm	3734	4267	4801	5334	6401	6934	8001
FIGURE 5 - TWO ELBOWS IN DIFFERENT PLANE							
A mm	12573	14351	16154	17932	21539	23317	26899
A'mm	5359	6121	6883	7620	9169	9931	11430
B mm	1600	1829	2057	2286	2743	2972	3429
C mm	2565	2946	3302	3658	4394	4775	5486
C'mm	2794	3175	3581	3962	4775	5156	5944

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