



HARSHAD ENGINEERING WORKS

PROVIDES HIGH QUALITY OVER PRESSURE PROTECTION
FOR AIR, GAS & STEAM IN STANDARDIZED DESIGN



ISO 9001 CERTIFIED COMPANY

SAFETY VALVE

SERIES # 004

DESIGN FEATURES

- SAFETY VALVE MANUFACTURED IN ACCORDANCE WITH REQUIREMENT OF ASME SECTION VIII DIVISION 1, API 526, API 527, EN ISO 4126 PART 1, IS 12992
- DIRECT SPRING OPERATED DESIGN
- FULL LIFT, FULL NOZZLE, SINGLE TRIM, & ATMOSPHERIC DISCHARGE DESIGN
- USED IN APPLICATION FOR COMPRESSED AIR, NON TOXIC, NON CORROSIVE & NON FLAMMABLE GASES. IT IS NOT SUITABLE FOR OXYGEN OR STEAM
- VITON RUBBER SEAT DESIGN FOR ZERO LEAKAGE
- BEST USE IN SCREW COMPRESSORS SYSTEM, PRESSURE VESSEL, AIR RECEIVER TANK, BABY BOILERS, GENERATORS, ETC.

TECHNICAL DATA : -

- SIZES : 1/2" TO 2" (ORIFICE "D", "E", "F", "H")
- END CONNECTION : THREAD END (BSP, BSPT & NPT)
- SET PRESSURE RANGE : 1BARG TO 25BARG
- TEMPERATURE RANGE : -20°C TO 200°C
- APPLICATION : AIR OR NON FLAMMABLE GAS



REV.6 / 05.2019

HARSHAD ENGINEERING WORKS

WORK & OFFICE ADDRESS : -
S-121 TO S-124, VIVEKANAND
INDUSTRIAL ESTAE, NEAR
RAKHIAL CROSS ROAD,
RAKHIAL, AHMEDABAD - 380 023.
GUJARAT, INDIA.

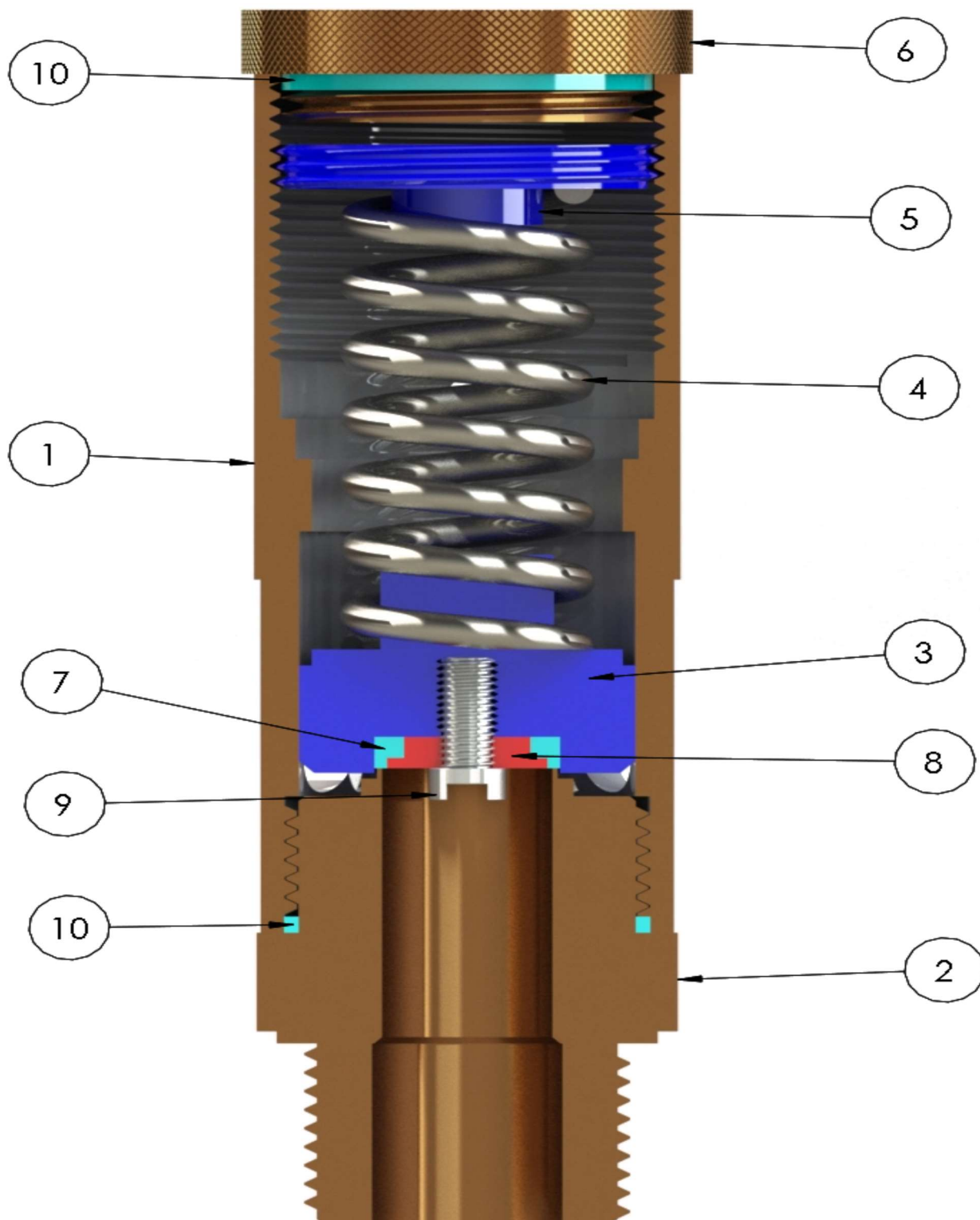
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SERIES # 004

G.A.DRAWING





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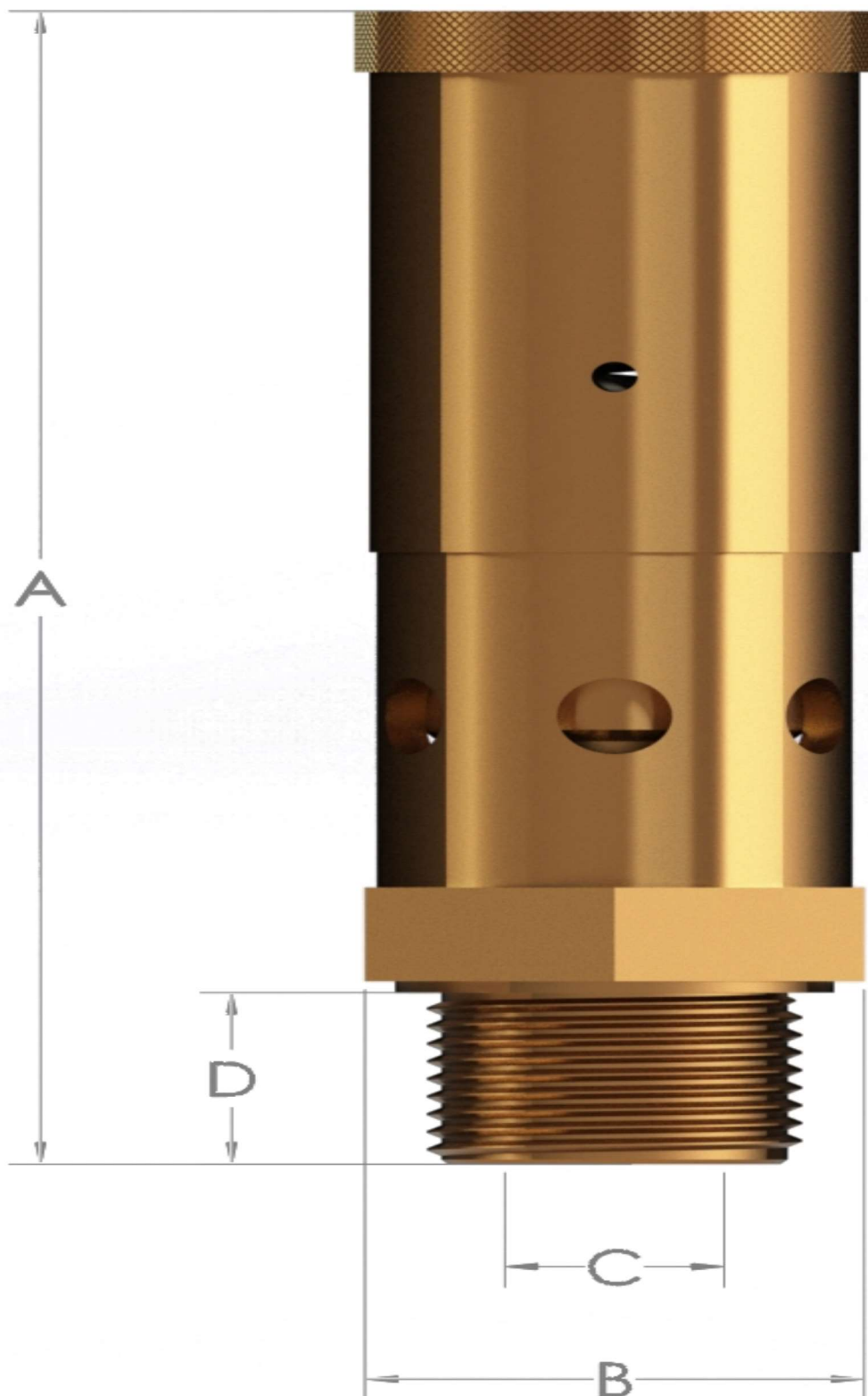
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MATERIAL OF CONSTRUCTION

PART LIST		<u>MODEL # 004-14</u> STANDARD MATERIAL CONSTRUCTION	<u>MODEL # 004-24</u> NON-FERROUS MATERIAL CONSTRUCTION
SR.NO.	DESCRIPTION	TEMPERATURE -20*°C TO 200*°C	TEMPERATURE -20*°C TO 200*°C
01	BODY	STAINLESS STEEL (ASTM A 351 CF8)	GUN METAL (IS 318 GR.LTB2)
02	NOZZLE	BRASS / GUN METAL	BRASS / GUN METAL
03	PISTON / DISC	BRASS / GUN METAL	BRASS / GUN METAL
04	SPRING (ZINC COATED)	SPRING STEEL (IS 4454 GR.IID)	SPRING STEEL (IS 4454 GR.IID)
05	CAP	S.G.IRON (BS 2789 400-15)	BRASS (IS 319 GR.1)
06	SETTING SCREW	BRASS (IS 319 GR.1)	BRASS (IS 319 GR.1)
07	SEAT	VITON RUBBER	VITON RUBBER
08	DISC WASHER	BRASS	BRASS
09	RETAINER (ZINC COATED)	HIGH TENSILE SCREW	HIGH TENSILE SCREW
10	"O RING"	NITRILE RUBBER	NITRILE RUBBER



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TECHNICAL DETAIL

SR.NO.	SIZES	ORIFICE (API526 & EN ISO 4126)		MAX SET PRESSURE (IN BARG)	A (MM) ± 5	B (MM) ± 2	C (MM) ± 2	D (MM) ± 2	APPROX WEIGHT (KG)
		DESIGNATION & EFFECTIVE AREA (IN ²)	ACTUAL AREA IN ² & INLET BRE (MM)						
1	1/2"	"D" (0.110)	0.12 (10MM)	25	184.0	60.0	30.0	15.0	1.2
2	3/4"	"E" (0.14)	0.23 (14MM)	25	110.0	38.0	14.0	20.0	1.5
3	1"	"F" (0.307)	0.35 (17MM)	25	148.0	42.0	17.0	23.0	1.8
4	1-1/4"	"G" (0.503)	0.59 (22MM)	25	140.0	46.0	22.0	23.0	2.2
5	1-1/2"	"H" (0.785)	1.24 (32MM)	25	170.0	57.0	32.0	23.0	2.5
6	2"	"H" (0.785)	1.24 (32MM)	15	172.0	70.0	40.0	26.0	4.1

NOTE :-

- 1.) SERIES # 004 SAFETY VALVE IS AVAILABLE IN THREAD END CONNECTION ONLY. (BSP, BSPT & NPT OR AS PER CUSTOMER SPECIFICATION)
- 2.) HYDRO TEST IS CONDUCTED FOR NOZZLES AT 1.5 TIMES OF DESIGN PRESSURE OF SAFETY VALVE AS PER API 526, API 598, EN ISO 4126 PART 1 & IS 12992.
- 3.) PNEUMATIC NOZZLE TEST CONDUCT ON 7BARG (100PSIG) AS PER ASME PRESSURE VESSEL SECTION VIII DIVISION.1.
- 4.) SEAT LEAKAGE TEST IS CONDUCTED AS PER API 527 OR AS SPECIFIED.
- 5.) TECHNICAL DATA SHEET WILL BE PROVIDED ON REQUEST.
- 6.) WE OFFER THIRD PARTY INSPECTION IF REQUIRED.(TUV, LLYODS, BVQI, SGS, ETC.)
- 7.) SAFETY VALVE IS SUPPLIED WITH ONE SET OF TEST CERTIFICATE OF HYDRO TEST, SET PRESSURE TEST & SEAT LEAKAGE TEST.
- 8.) SAFETY VALVE COMES WITH GUARANTEE OF 12MONTHS FROM THE DATE OF SUPPLY.



HARSHAD ENGINEERING WORKS

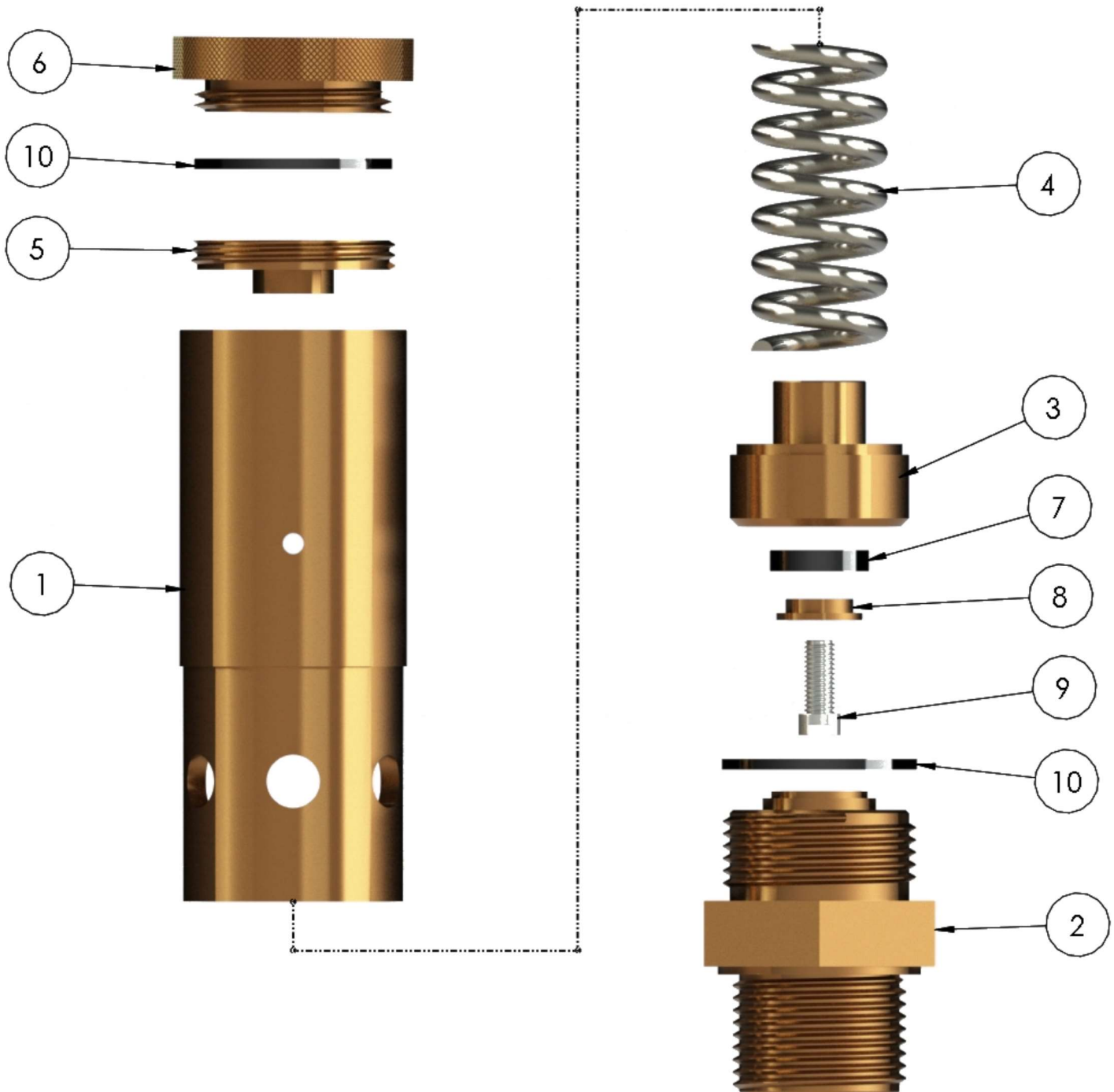
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SERIES # 004

ASSEMBLY DRAWING



SERIES # 004

INSTALLATION DIAGRAM

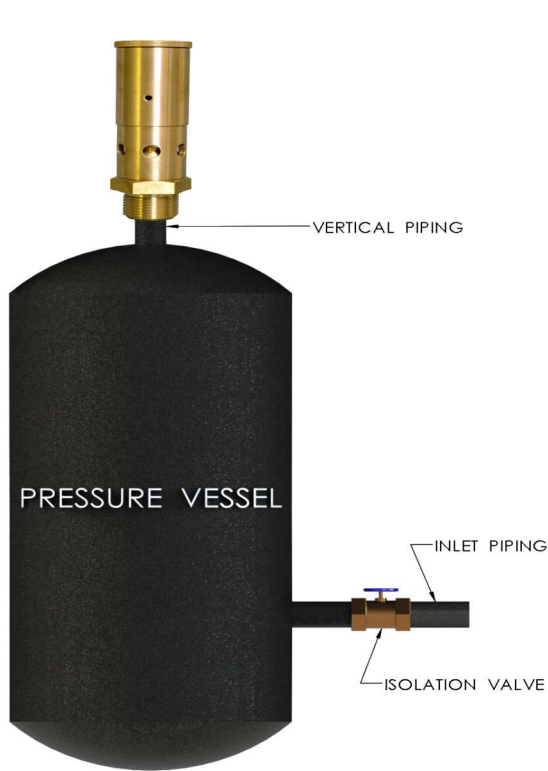


DIAGRAM A

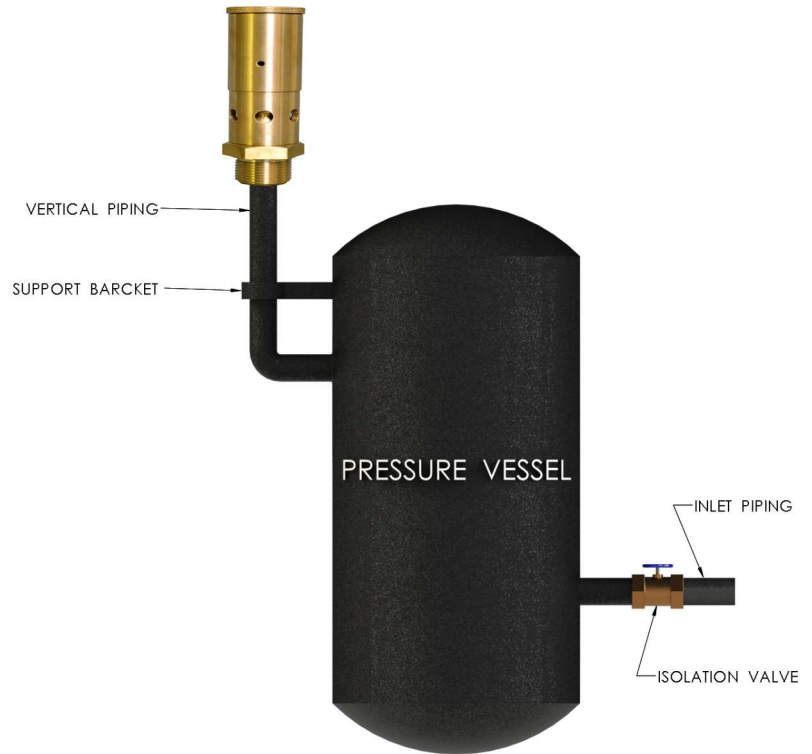


DIAGRAM B



DIAGRAM C

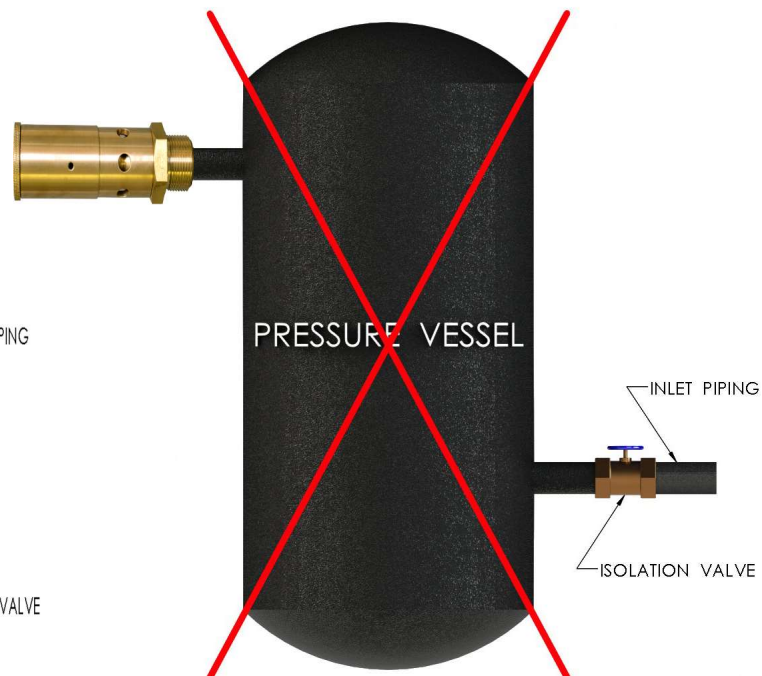


DIAGRAM D



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COLD DIFFERENTIAL TEST PRESSURE

WHEN SETTING A VALVE INTENDED FOR USE AT HIGH TEMPERATURE ON A TEST RIG USING A TEST FLUID AT AMBIENT TEMPERATURES, IT IS NECESSARY TO SET THE VALVE AT SLIGHTLY HIGHER PRESSURE, SO THAT IT WILL OPEN AT THE CORRECT SET PRESSURE UNDER OPERATING CONDITIONS. THE NECESSARIES ALLOWANCE IS SHOWN IN THE FOLLOWING TABLE.

OPERATING TEMPERATURE (CENTIGRADE)	OPERATING TEMPERATURE (FAHRENHEIT)	% INCREASE IN SET PRESSURE AT (AMBIENT TEMPERATURE)
UPTO 121 *C	UPTO 250 *F	0 %
122 *C TO 316 *C	251 *F TO 600 *F	1 %
317 *C TO 427 *C	601 *F TO 800 *F	2 %
428 *C TO 538 *C	801 *F TO 1000 *F	3 %



HARSHAD ENGINEERING WORKS

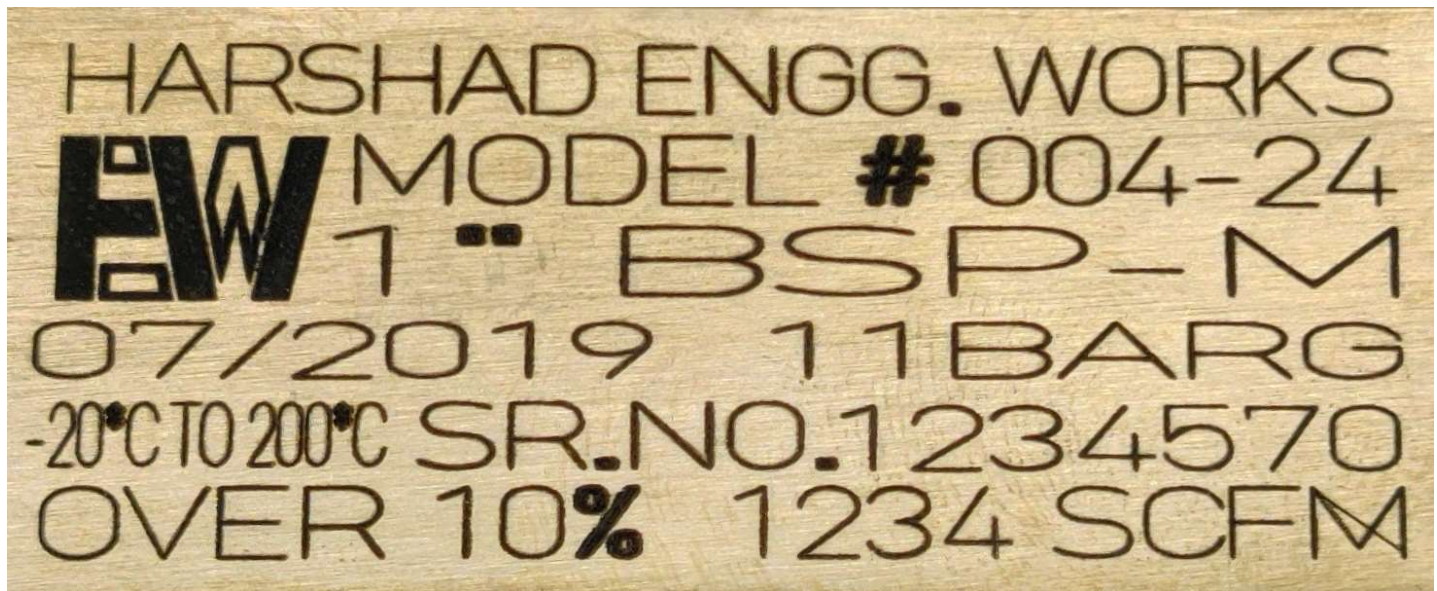
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MARKING DETAIL



EVERY SAFETY VALVE IS LASER MARKED ACCORDING TO ABOVE LABEL

LASER MARKING DETAIL

LINE NO. 01 = MANUFACTURER NAME AND LOGO

LINE NO. 02 = PART # / MODEL #

LINE NO. 03 = SIZE & THREAD END TYPE

LINE NO. 04 = DATE OF MFG & SET PRESSURE

LINE NO. 05 = WORKING TEMP. RANGE & UNIQUE SR.NO.

LINE NO. 06 = OVER PRESSURE & FLOW RATE



HARSHAD ENGINEERING WORKS

SAFETY VALVE



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AIR CAPACITY TABLE

Air Capacities in Standard Cubic Metres Per Minute (SCFM) @ 15°C & 10% Over Pressure as per API 520

SET PRESSURE (BARG)	ORIFICE AREA, IN2 & MM2				
	“D”	“E”	“F”	“G”	“H”
Orifice in In2	0.12in2	0.23in2	0.35in2	0.59in2	1.24in2
Orifice in mm2	77.42mm2	148.39mm2	225.81mm2	380.64mm2	961.29mm2
1	59	113	189	291	734
2	90	172	263	442	1116
3	121	231	352	593	1497
4	151	290	441	744	1879
5	182	349	531	895	2261
6	213	408	621	1047	2643
7	244	467	711	1198	3025
8	274	526	800	1349	3407
9	305	585	890	1500	3789
10	336	644	980	1651	4171
11	367	703	1069	1803	4553
12	397	762	1159	1954	4934
13	428	821	1249	2105	5316
14	459	880	1339	2256	5698
15	490	939	1428	2408	6080
16	520	997	1518	2559	***
17	551	1056	1608	2710	***
18	582	1115	1697	2861	***
19	613	1174	1787	3012	***
20	643	1233	1877	3164	***
21	674	1292	1966	3315	***
22	705	1351	2056	3466	***
23	736	1410	2146	3617	***
24	766	1469	2236	3769	***
25	797	1528	2325	3920	***

NOTE :-

REV.6 / 05.2019

1.) CAPACITIES BELOW 2BARG SET PRESSURE ARE CALCULATED AT 0.2BAR OVER PRESSURE.

2.) TO DETERMINE CAPACITIES ON GASES OTHER THAN AIR OR VAPOURS, PLEASE CONSULT HARSHAD ENGINEERING WORKS (HEW).



HARSHAD ENGINEERING WORKS

SAFETY VALVE



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AIR CAPACITY TABLE

Air Capacities in KG/HR @ 15°C & 10% Over Pressure as per EN ISO 4126 Part.1

SET PRESSURE (BARG)	ORIFICE AREA, IN2 & MM2				
	“D”	“E”	“F”	“G”	“H”
Orifice in In2	0.12in2	0.23in2	0.35in2	0.59in2	1.24in2
Orifice in mm2	77.42mm2	148.39mm2	225.81mm2	380.64mm2	961.29mm2
1	123	236	359	604	902
2	187	358	545	919	1371
3	251	481	732	1234	1840
4	315	604	919	1548	2309
5	379	726	1105	1863	2779
6	443	849	1292	2178	3248
7	507	972	1479	2492	3717
8	571	1094	1665	2807	4187
9	635	1217	1852	3122	4656
10	699	1340	2038	3436	5125
11	763	1462	2225	3751	5595
12	827	1585	2412	4066	6064
13	891	1708	2598	4380	6533
14	955	1830	2785	4695	7003
15	1019	1953	2972	5009	7472
16	1083	2076	3158	5324	***
17	1147	2198	3345	5639	***
18	1211	2321	3532	5953	***
19	1275	2444	3718	6268	***
20	1339	2566	3905	6583	***
21	1403	2689	4092	6897	***
22	1467	2812	4278	7212	***
23	1531	2934	4465	7527	***
24	1595	3057	4652	7841	***
25	1659	3180	4838	8156	***

NOTE :-

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2.) TO DETERMINE CAPACITIES ON GASES OTHER THAN AIR OR VAPOURS, PLEASE CONSULT HARSHAD ENGINEERING WORKS (HEW).



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INSTALLATION & PRESSURE ADJUSTMENT

GUIDELINE

1.) INSTALLATION GUIDELINE :-

- SAFETY VALVES SHOULD BE ALWAYS MOUNTED VERTICALLY ON THE PRESSURE VESSEL, BOILERS OR PIPELINE.
- ALL THE PACKING MATERIALS SHOULD BE REMOVED FROM THE VALVE CONNECTION PRIOR TO INSTALLATION.
- NEVER LIFT VALVE FROM ITS HANDLE OR LEVER, IT DAMAGES THE SPINDLE ALIGNMENT WHICH RESULTS IN MALFUNCTION OR NOT WORK AT ALL.
- IF SAFETY VALVE ONCE REACHED THE SITE AND ITS NOT GOING TO USE RIGHT AWAY THEN IT HAS TO STORE IN DRY, & FREE OF DIRT AND SHOULD MAINTAIN THE STORAGE TEMPERATURE -20°C TO 50°C. AND PROTECTIVE SHOULD NOT BE REMOVED WHEN IT IS NOT IN USE.
- WHILE INSTALLING SAFETY VALVE USE METAL OR PLASTIC SEAL WASHER ONLY. TEMPORARY SEAL MATERIAL SUCH AS PTFE / TEFLON TAPE OR LIQUID SEAL MATERIAL SHOULD NOT BE USED AS THIS TYPE OF MATERIAL BREAK OFF AND ENTER THE SAFETY VALVE AND DAMAGES THE SEAT OF VALVE WHICH RESULTS IN CONTINUOUS LEAKAGE.

2.) INSTALLATION ON PRESSURE VESSELS:-

- WHEN FITTING A SAFETY VALVE ONTO PRESSURE VESSELS, THE INLET CONNECTION PIPE SHOULD BE AS SHORT AS POSSIBLE AND THE BORE SHOULD BE AT LEAST EQUIVALENT TO THE NOMINAL BORE SIZE OF THE VALVE. SO THAT THE PRESSURE DROP BETWEEN THE VESSEL AND THE VALVE SHOULD BE NO MORE THAN 3% RATED CAPACITY.
- IT IS ESSENTIAL THAT NEW INSTALLATIONS ARE FULLY FLUSHED AND ALL DEBRIS AND FOREIGN PARTICLES REMOVED PRIOR TO INSTALLING THE VALVE AS SERIOUS DAMAGE CAN BE CAUSED TO THE VALVE SEATS RESULTING IN SUBSEQUENT LEAKAGE AND MALFUNCTION.
- THERE SHALL BE NO INTERVENING STOP VALVES BETWEEN THE VESSEL AND SAFETY VALVES.

3.) INSTALLATION ON PIPELINES:-

WHEN FITTING A SAFETY VALVE INTO A PIPELINE, THE INLET CONNECTING PIPE LEADING FROM THE MAIN PIPELINE TO THE SAFETY VALVE SHOULD BE AS SHORT AS POSSIBLE, SO THAT THE INLET PRESSURE DROP IS NO MORE THAN 3% OF RATED CAPACITY.

4.) PRESSURE ADJUSTMENT GUIDELINE :-

EVERY VALVE IS FITTED WITH A SUITABLE SPRING AND TESTED BEFORE LEAVING THE FACTORY. SAFETY VALVES CAN BE PRESET ON REQUEST BUT TO ALTER THE SET PRESSURE, THE ADJUSTING SCREW, WHEN VIEWED FROM THE TOP, SHOULD BE SCREWED DOWNWARDS IN A CLOCKWISE DIRECTION TO INCREASE THE SET PRESSURE AND UPWARDS IN AN ANTI-CLOCK WISE DIRECTION TO DECREASE IT. SET PRESSURE ADJUSTMENT MUST BE CARRIED OUT BY EXPERIENCED AND APPROVED PERSONNEL. ANY CHANGE IN SET PRESSURE MUST BE WITHIN THE RANGE OF EXISTING SPRING, IF IT EXCEEDS THE RANGE, A NEW SPRING WILL BE REQUIRED.

5.) BLOW-DOWN ADJUSTMENT:-

BLOW DOWN CAN'T BE ALTER, IT IS FIXED BLOW DOWN DESIGN. BLOW DOWN WILL BE BETWEEN 7 TO 10% OF SET PRESSURE.

6.) SERVICE, MAINTENANCE & CALIBRATION:-

- A SET PRESSURE FUNCTION TEST SHOULD BE CARRIED OUT AT LEAST ONCE A YEAR. THE DETAILED TEST PROCEDURE IS DETERMINED BY THE USER.
- SAFETY VALVE REQUIRES REGULAR MAINTENANCE AND CALIBRATION ONCE A YEAR.

7.) DISMANTLING THE VALVE :-

THE FOLLOWING POINTS MUST BE OBSERVED BEFORE DISMANTLING SAFETY VALVES :-

- THERE WOULD BE NO PRESSURE IN SYSTEM OR VESSEL BEFORE REMOVING SAFETY VALVE.
- MEDIUM OR APPLICATION MUST BE COOL & COMPLETELY DRAIN FROM VESSEL OR PIPELINE.
- ASSEMBLY WORK MUST BE CARRIED BY QUALIFIED PERSONNEL.

8.) REPAIRS:-

REPAIRS ON SAFETY VALVES CAN ONLY BE CARRIED BY AUTHORIZED PERSONNEL OR BY HARSHAD ENGINEERING WORKS.



HARSHAD ENGINEERING WORKS

SAFETY VALVE



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WARRANTY POLICY

HARSHAD ENGINEERING WORKS (HEW) HEREBY WARRANTS THAT THE GOODS DELIVERED UNDER CONTRACT WILL BE FREE FROM DEFECT IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF 18 MONTHS FROM SHIPMENT OR 12 MONTHS FROM INSTALLATION WHICHEVER IS EARLIER. WITHIN THIS PERIOD, ANY OF OUR PRODUCTS CLAIMED DEFECTIVE MAY BE RETURNED TO OUR FACTORY IN AHMEDABAD, INDIA AFTER WRITTEN NOTIFICATION TO AND AUTHORIZATION BY US, AND IF FOUND TO BE DEFECTIVE AFTER EXAMINATION BY US, THE PRODUCT WILL BE REPAIRED OR REPLACED FREE OF CHARGE. SUCH DEFECTS SHALL BE EXCLUSIVE OF THE EFFECTS OF CORROSION, EROSION, NORMAL WEAR OR IMPROPER HANDLING OR STORAGE. AFTER EXAMINATION IF IT IS MANUFACTURING DEFECT FREIGHT CHARGES INWARD AND OUTWARD WILL BE BORNE BY US.

HEW MAKES NO REPRESENTATION, WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, WITH REGARD TO OUR PRODUCTS EXCEPT AS SPECIFICALLY STATED. WHEN IN DOUBT AS TO THE PROPER APPLICATION OF AN PARTICULAR PRODUCT, YOU ARE INVITED TO CONTACT HEW OFFICE AT ANY TIME. WE CANNOT OTHERWISE BE RESPONSIBLE FOR THE SELECTION OF UNSUITABLE EQUIPMENT. SUITABILITY OF THE MATERIAL AND PRODUCT FOR THE USE CONTEMPLATED BY THE BUYER SHALL BE THE SOLE RESPONSIBILITY OF THE BUYER.

EXCEPT AS SPECIFICALLY SET FORTH ABOVE AND FOR WARRANTY OF TITLE, HEW MAKES NO WARRANTY, EXPRESS OR IMPLIED, OF ANY KIND INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

IF SEAL IS FOUND IN BROKEN CONDITIONS DURING EXAMINATION HEW WILL CONSIDERED THAT THE PRODUCT IS BEEN TEMPERED AND IT WON'T TAKE ANY RESPONSIBILITY OF MANUFACTURING OR WORKMANSHIP OR PERFORMANCE OF THE SAFETY VALVE. MANUFACTURING WARRANTY WILL EXPIRE RIGHT AWAY.

IN NO EVENT WILL HEW BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES

SAFETY VALVE IS SAFETY RELATED COMPONENT INTENDED FOR USE IN CRITICAL APPLICATIONS. THE IMPROPER APPLICATION, INSTALLATION OR MAINTENANCE OF THE PRODUCT OR USE OF PARTS OR COMPONENTS NOT MANUFACTURED BY HEW MAY RESULT IN A FAILURE OF THE PRODUCT. THE ADVICE OF QUALIFIED ENGINEER SHOULD BE SOUGHT PRIOR TO ANY USE OF PRODUCT.

ANY INSTALLATION, MAINTENANCE, PRESSURE ADJUSTMENT, REPAIR OR TEST PERFORMED ON THE PRODUCT MUST BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF ALL APPLICABLE CODES AND STANDARDS.

THE INFORMATION, SPECIFICATIONS AND TECHNICAL DATA CONTAINED IN THIS DOCUMENT ARE SUBJECT TO CHANGE WITHOUT NOTICE. HEW DOES NOT WARRANT THAT THE SPECIFICATIONS ARE CURRENT AND ASSUMES NO RESPONSIBILITY FOR THE USE OR MISUSE THEREOF. THE PURCHASER SHOULD VERIFY THAT THERE HAVE BEEN NO CHANGES TO THE SPECIFICATIONS PRIOR TO USE.