

QualSteam

Temperature Control System at Optimum Steam Pressure with Steam Flow Indication

Description

QualSteam is a pre-insulated control valve system for steam pressure and process temperature combo control. The system is developed for process temperature control at optimum steam pressure. In addition, it indicates the live and totalized indicative values of steam flow on display.

The system runs two PID loops simultaneously; one for temperature control and second for pressure control. The system measures process temperature, temperature setpoint, steam pressure and analyses the effect of incremental change in opening and closing of control valve on change in pressure and temperature and iteratively computes a pressure value equal to below maximum limit of steam pressure and changes it dynamically such that process temperature gets achieved at optimum steam pressure.

Size and End Connections

End connections : Flanged (#150)

Size available : DN15, 20, 25, 40, 50, 65, 80 & 100

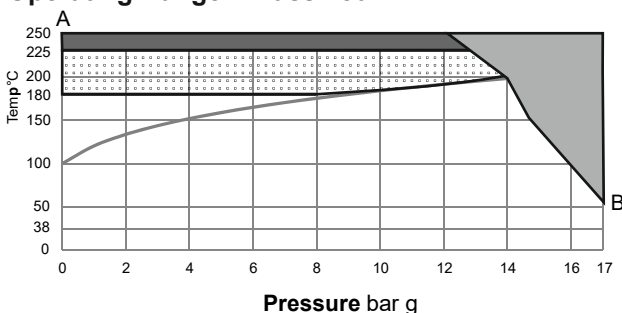
Available with IBR on request

Limiting Condition

Body Design Condition	#150
Max Allowable Design Pressure	17 bar (g) @ 38 °C
Max Allowable Design Temperature	225 °C
Min. Allowable Design Temp	-10 °C
Maximum cold Hydraulic Test Pressure	26 barg
Max Operating Temp (Standard Metal seat)	200 °C
Max Operating Temp (Softseat)	180 °C

Operating Characteristic - Equal percentage

Operating Range - Class 150



A - B SG Iron PT rating curve ASME B16.42

■ The product must not be used in this region.

Class 150 valves are PTFE packing valves and hence are limited to a maximum operating temperature 225 °C

▨ SOFT seated valve must not be used in this region.

Compatible Actuators and Positioner

Actuator	Pneumatic, multi-spring diaphragm A series actuator A0, A1 and A2
Positioner	electro - Pneumatic

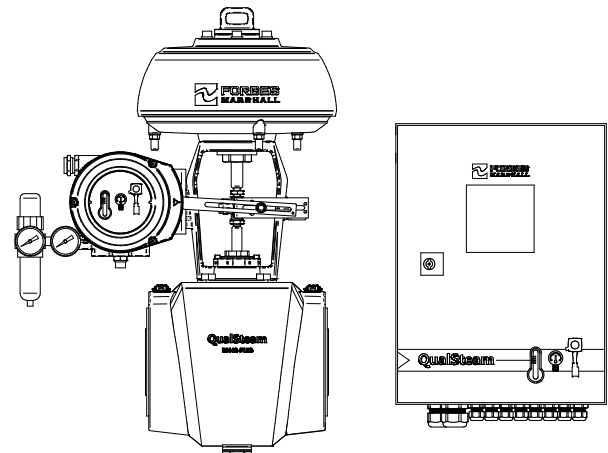


Fig.-1

Actuator A-Series :

Compact range of single acting, spring return, linear stroke actuators that are available in 3 different diaphragm diameters. This is to fulfil opening/closing of valves at various differential pressures.

Size Range

Actuators are available in A0, A1 and A2 model numbers based on valve thrust requirement.

Versions

NC – Normally closed (Fail safe – closed /Air to open)

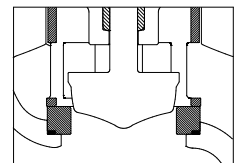
Without handwheel

Available Trim Options:

STD Trim with metal seating

Hardened Parabolic plug, Cage retained seat.

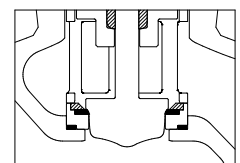
Metal to metal Seated (Leakage class IV), quick replaceable trim.



STD Trim with Soft seating

Parabolic plug, Cage retained seat with Virgin PTFE seat insert.

Leakage class VI, quick replaceable trim available in Max Kvs only.



Technical Data

Plug design	Parabolic (Equal percent characteristic)
Leakage class	Class IV and VI as per FCI 70.2
Rangeability	50:1
Travel	16 mm-DN15, DN20 and DN25 20 mm-DN40 and DN50 30 mm-DN65, DN80 and DN100
Face to face	ISA 75.08.01 for ANSI #150 Flanges Version
Steam Flow	Indicative flow calculated as per Kv, measured up steam & downstream pressure & valve opening.

Control Panel

Size	300(W) x 400(H) x 210(D) mm
Display	4-line B&W Display with multiple screens
Power Supply	100-230V, 50/60 Hz
Input - Output	5 AI – 4-20 mA, 1 AO– 4-20 mA
Communication	RS-485 Modbus Output of Display parameters
Digital Connectivity	Through RTru
Environmental Conditions	Temperature: 0 to 55°C Operating, -20 to 70°C Storage, RH: 10 to 95%
Color	RAL 5010
Weight	12 kg.
Protection Category to IEC-60529	IP 65

Display Parameters

Sr.No.	Parameter
1	Supply steam pressure (bar)
2	Condensing pressure (bar)
3	Steam flow rate (kg/h)
4	Steam flow rate totalizer value (kg)
5	Process Temperature (°C)
6	Process Temperature setpoint (°C)
7	Maximum pressure setpoint (bar)
8	Control valve opening

Standard Bill of Materials

Sr.No.	Item Description	Qty.	Material
1	QualSteam Valve	1	SG IRON ASTM A395
2	Positioner	1	-
3	Piston Valve	2	ASTM A105N
4	Syphons	2	ASTM A312 SS316
5	Pressure Transmitters	2	SS304
6	Control Panel	1	SHEET STEEL
7	Insulation	1	FRP+PU foam
8	4-20mA Signal Isolator	1	-

Pre-requisite items (Not included in Standard BOM)

No.	Item Description
1	Process Temperature Transmitter (4-20mA, 2-Wire)

Note: All cables and wires from all instruments, gaskets and hardware material are excluded from scope of supply

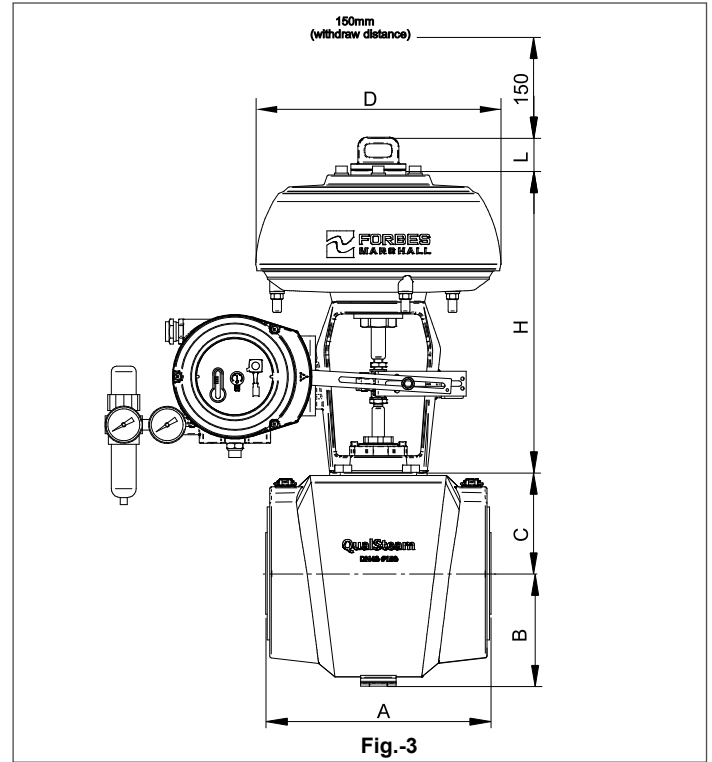


Fig.-3

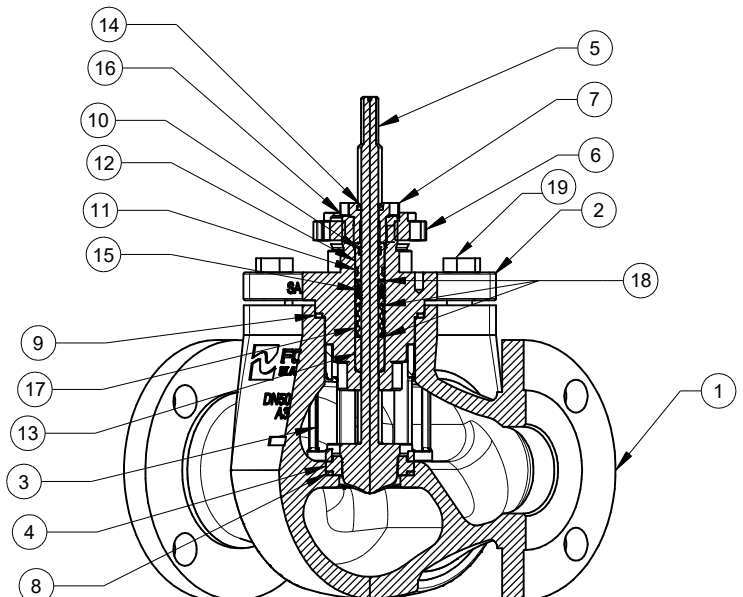
Dimension details (approx in mm) & weights (approx. in Kg) #150

Valve size	End conn.	A	B	C	H	L	D	Total Wt without handwheel
Dn15	Flanged	184	98	103	273	37	150	15.2
DN20	Flanged	184	98	103	273	37	150	15.4
DN25	Flanged	184	98	98	273	37	150	15.6
DN40	Flanged	222	127	114	341	37	150	27.2
DN50	Flanged	254	127	114	341	37	150	30
DN65	Flanged	276	161	154	434	44	150	52.5
DN80	Flanged	298	154	155	434	44	150	63.4
DN100	Flanged	352	187	161	434	44	150	74.5

Materials (Refer Fig.2)

SR.NO	ITEM	MATERIAL
1	BODY	SG IRON ASTM A395
2	BONNET	SG IRON ASTM A395
3	CAGE	BS3146(ANC-2)
4	SEAT	ASTM A276 TYPE 431
5	SPINDLE WITH PLUG	ASTM A276 TYPE 431
6	SLOTTED NUT	ASTM A276 TYPE 304
7	GLAND NUT	ASTM A276 TYPE 316
8	SEAT GASKET	Exfoliated Graphite
9	BODY TOP GASKET	Spiral Wound Graphite
10	TOP O-RING	Viton
11	BOTTOM O-RING	Viton
12	GLAND BUSH	PTFE
13	GUIDE BUSH	PTFE
14	SCRAPPER RING	PTFE
15	V-RING SET	PTFE
16	SLIDING BEARING	Sintered Bronze
17	PACKING SPRING	Stainless Steel BS. 2056 316 S42
18	SPACER	Stainless Steel ASTM A276 TYPE 316
19	BOLT	Carbon Steel ASTM A193 B7

Fig.2 : Valve Selection View



Actuator Normally Closed Version

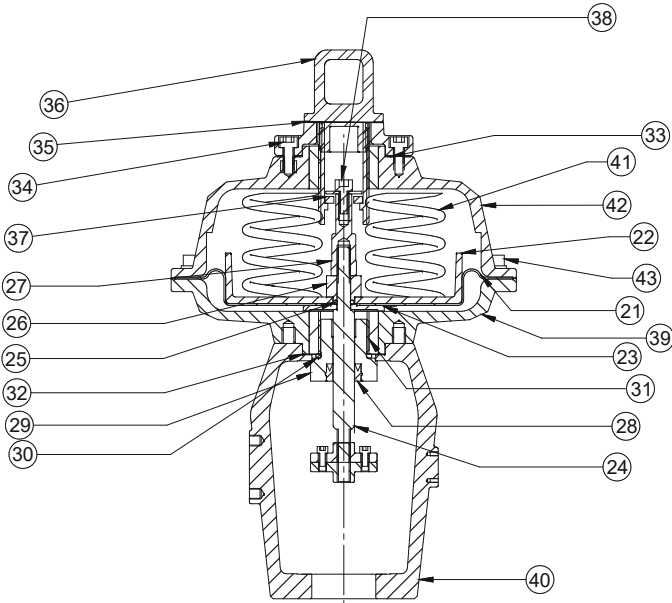


Fig.- 4

Material : Normally Closed Version

Sr.no	Item	Material
21	Diaphragm	Fibre reinforced NBR
22	Piston	BS1490 LM9
23	Supporting Spacer	ASTM A276 TYPE 316
24	Lower Stem	ASTM A276 TYPE 316
25	Stem O Ring	Nitrile
26	Bush	ASTM A276 TYPE 316
27	Upper Stem	ASTM A276 TYPE 316
28	WDB (Stem) Seal	PU-5 (Polyurethane)
29	WDB Seal Holder	ASTM A276 TYPE 316
30	O Ring	Nitrile
31	DU Bearing	P1 ISO 3547-4
32	Gasket	Nitrile
33	Gasket	Nitrile
34	Soc.HD.Screw	ASTM A276 SS304
35	O Ring	Nitrile
36	Lifting Hook	A351 Cf8
37	Thrust Bearing	AS1024
38	Allen Bolt	ASTM A276 SS304
39	Small Housing	BS 1490 LM9
40	Yoke	ASTM A395 Gr.60-40-18
41	Springs	Chrome Silicon (CS)
42	Upper Housing	BS 1490 LM9
43	Soc.HD.Screw	ASTM A276 SS304

Thrust Data

Actuator Size	Diaphragm effective area (cm ²)	Normally Close (Air To Open)				Thrust Force, (KN)
		No. of springs	Stroke (mm)	Control spring range (bar.g) From To		
A0	105	1	16	0.9	1.5	0.85
		2	16	1.5	2.5	1.5
A1	294	3	20	1.1	1.9	3
		6	20	1.5	2.7	4.2
A2	702	6	30	1.5	2.7	10.2
		12	30	2.3	4.2	16

How to Order Spares

Always order spares by using the description given in the column headed 'Available spares', and provided in Users Manual.

Example: Plug stem and seat for QualSteam

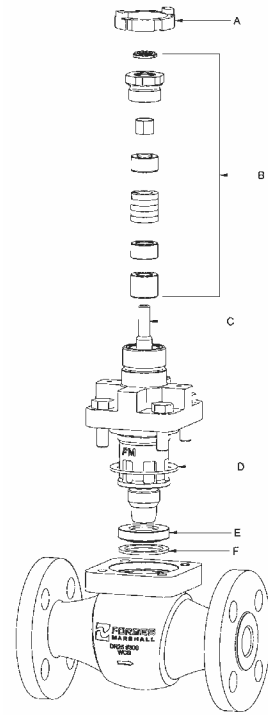


Fig.- 5

Available Valve Spare Parts

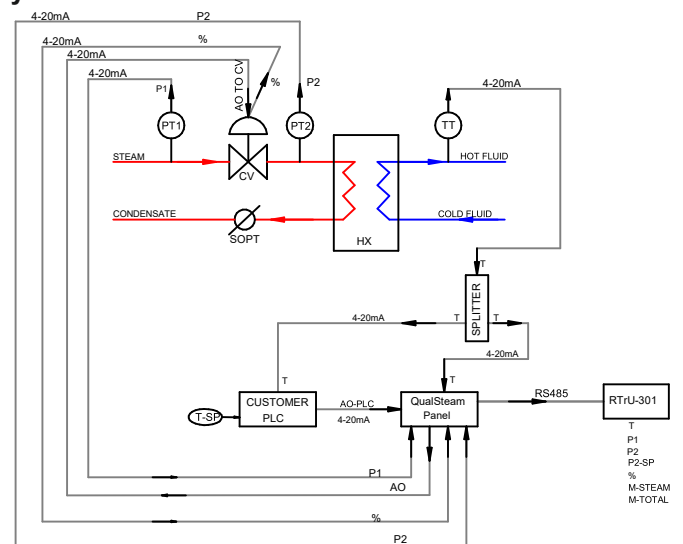
The spare parts available are shown in solid outline. Parts drawn in broken line are not supplied as spares. Full fitting instructions are given in the installation and maintenance manual supplied with the spare.

Actuator Clamping Nut		A
Gasket set		D, F
Stem seal kits	PTFE chevrons	B
Plug stem and seat	(No gaskets supplied)	C, E
Stem packing and gasket		F, D, B

Available Actuator Spare Parts

Springs kit	All springs	41
Diaphragm kit	Diaphragm and stem o-ring	21,25
WDB seal holder kit	WDB seal holder, WDB seal, DU bearing and O ring	28, 29, 30, 31
Seal, o-rings and gasket kit	NC all o-rings, WDB seal, all gaskets, lip seal	25, 30, 35, 32, 28
Stem kit	Lower stem and WDB seal	24, 28

System Architecture



Kv Details :

Size	Travel	KV Values Parabolic Equal Percent & Linear Trim		
		Std Kv	Redn 1	Redn 2
DN15	16mm	5	3	1.6
DN20	16mm	6.3	5	3
DN25	16mm	10	6.3	5
DN40	20mm	26	10	6.3
DN50	20mm	36	26	10
DN65	30mm	63	36	26
DN80	30mm	102	63	36
DN100	30mm	160	102	63

Product Codification

Parameter	Code		Example
SIZE (NB)	15NB	015	015
	20NB	020	
	25NB	025	
	40NB	040	
	50NB	050	
	65NB	065	
	80NB	080	
	100NB	100	
MODEL NAME	QualSteam	QSV	QSV
CONNECTION DETAILS	FLANGED #150	Q	Q
TRIM TYPE	NON BALANCED	1	1
VALVE CHARACTERISTICS	EQUAL PERCENT (FTO)	E	E
Kv(SEAT DIA) _STROKE	1.6(9.5)_16	A	C
	3(12)_16	B	
	5 (15.5)_16	C	
	6.3 (18.5)_16	D	
	10.5 (23)_16	E	
	26 (37)_20	F	
	36 (45.5)_20	G	
	26(37)_30	H	
	36(45.5)_30	I	
	63 (52)_30	J	
102 (76)_30	K		
160 (96)_30	L		
BONNET DESIGN	STD (A 216 Gr. WCB)	S	S
BODY	A395 SG IRON	4	4
TRIM MOC	SS431 (Nitrided)	1	1

Parameter	Code	Example
SEATING	METAL TO METAL	M
	SOFT SEAT (only for 15NB to 100NB)	S
APPROVAL	IBR	I
	NIBR	N
ACTUATOR MODEL	A0-NC-1 SPRING	S1
	A0-NC-2 SPRINGS	S2
	A1-NC-3 SPRINGS	M1
	A1-NC-6 SPRINGS	M2
	A2-NC-6 SPRINGS	L1
	A2-NC-12 SPRINGS	L2
HANDWHEEL	WITH OUT HANDWHEEL	C
POSITIONER	ePOZ	E
CTRL PANEL POWER SUPPLY	110 -230V AC 50/60 HZ	7
INSULATION	WITH INSULATION	I
ACCESSORIES	WITH (PT+SYP+PSVAL)	S
	NA	N

How to Order

Based on sizing sheet & product codification chart required code can be defined & ordered.

Selection Example

015 QSV - Q 1 E C S 4 1 M I - S1 C E 7 I S



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