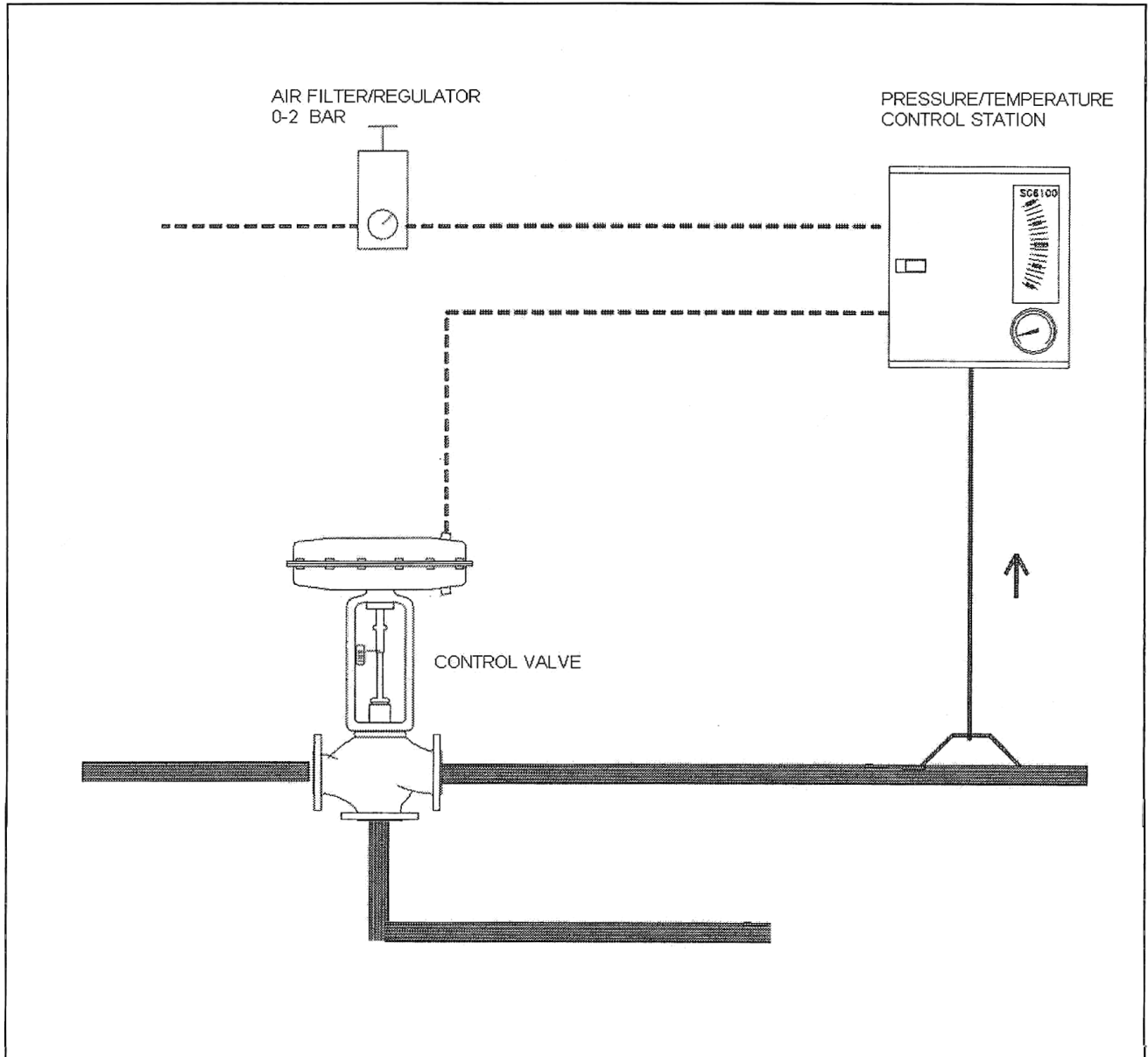




PRODUCT SHEET

TEMPERATURE CONTROL SYSTEM

SYSTEM DESCRIPTION



system lay-out of Mar-In Controls temperature control system

The system comprises the following components:

CONTROL STATION TYPE SG6100

CONTROL VALVE TYPES L30 or N90

AIR FILTER/REGULATOR TYPE FR64

Technical data and overall dimensions of the above mentioned components will be discussed in the sections here after. MAR-IN CONTROLS pneumatic temperature Control System is available for temperature ranges up to 250°C and can be used for fluids as well as gases.

DESCRIPTION CONTROLLER SG6100

The MAR-IN CONTROLS SG 6100 Pressure Control Station can be used to control and indicate industrial process variables. It employs direct measuring elements for pressure and temperature and sends a modulated signal to pneumatic actuators (e.g. a control valve).

Technical data**Ambient temperature limits**

service	: -40 to +70°C.
storage	: -50 to +80°C.

Case

dimensions	: 192 x 192 mm DIN 43700
protection grade	: IP 55 - IEC 144
material	: Reinforced Technopolymer

**Control Unit**

motion balance

Control actions and ranges of adjustment

P	: BP 2/200% (Kp 50/0.5)
P + I	: BP 4/400% (Kp 25/0.25) ; Ti 0.1/25 min

Direct/Reverse acting : reversible by rotating the BP dial**Intrinsic Proportional Band (P+I)** : 0.5%**Drift for variation of ambient temperature within -20 and +60°C** : $\leq 0.035\%/^{\circ}\text{C}$ **Drift for variation of supply pressure within 1.2 and 1.7 bar** : $\leq 0.15\%/0.1 \text{ bar}$ **Air Supply** : $1.4 \pm 0.1 \text{ bar}$ **Air Consumption in steady state** : 400 gr/h**Output signal** : 5 to 95% of supply pressure**Scale** : vertical, 75 mm**Set Point** : local, mechanical, with internal knob, adjustable over full scale range**Output Indicator**

scale	: 0..2 bar and 0..30 psi
accuracy	: $\pm 2\%$



PRODUCT SHEET

CONTROLLER SG6100

Measuring Elements

Accuracy (% of span)

Linearity and hysteresis	: $\pm 1\%$
Repeatability	: $\leq 0.25\%$
Dead zone	: $\leq 0.2\%$

Pressure - Vacuum - Receiver

connection	: AISI 316 C-type tube spring
overpressure	: 1/4" NPT f.
	: 25% u.s.v.

Temperature

connection	: mercury filled, AISI 316 st.st. bulb with;
Adjustable immersion	: 1/2" NPT m.
	: 350 mm. AISI 316 st.st. capillary, 3 m length.

Overtemperature

: see codification

Mounting

: panel or wall

Options

: protection IP 65
: capillary 6 m length



PRODUCT SHEET
CONTROLLER SG6100

CODIFICATION

CODE NUMBER: SG6100 1 o o o

Pneumatic Indicator Controller

Control Action	Proportional	1
	Proportional and Integral	2

Standard Scale Ranges

Vacuum	1..0 bar	1
Pressure	0..2.5bar	2
	0..4 bar	3
	0..6 bar	4
	0..10 bar	5
	0..16 bar	6
	0..25 bar	7
	0..40 bar	8
	Receiver	0.2..1 bar / 0..100 linear
0.2..1 bar / 0..10 square root		C

Temperature

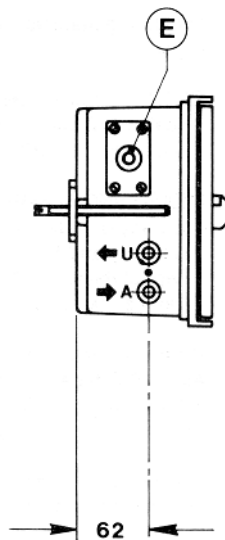
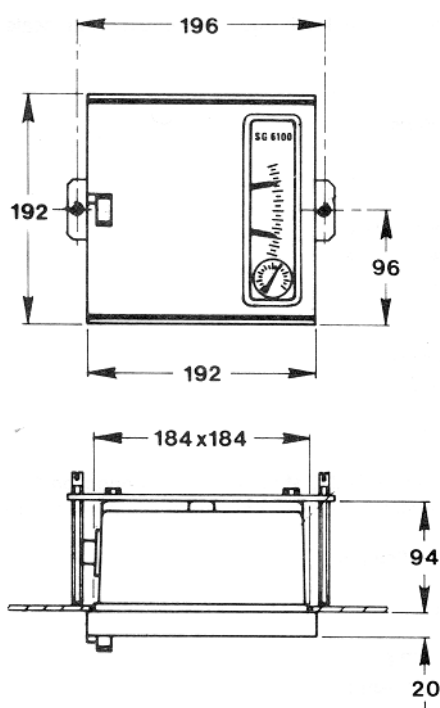
	Overrange	Y	
-20..+40°C	70	160	H
0..+60°C	70	160	K
0..100°C	140	105	L
0..160°C	240	75	M
0..250°C	320	75	N

Options

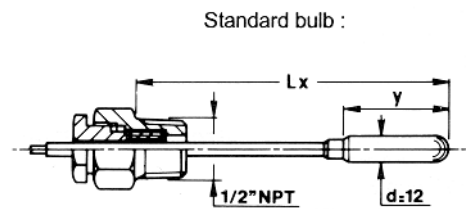
without	0
capillary 6 m	1
feature as per IP 65	2
feature as per IP 65 with 6 m of capillary	3
mounting bracket for 2 inch horizontal or vertical pipe	4

Ambient temperature	: - 40 to + 70 °C
Material case	: Reinforced technopolymer
Protection grade	: IP 55
Control action	: P.I. BP 4-400% (Kp 25-0.25); Ti 0.1-25 min
Air supply	: 1,4 bar clean, dry and oil-free instrument air
Air consumption	: 400 gr/h
Air connections	: 1/4" NPT (internal)
Input	: range indicated inside controller. 0 - 2.5 bar up to 0 - 40 bar -20°C to 40°C up to 0°C - 250°C 0,2 - 1,0 bar

Dimensions in mm



- A) Air supply.
- U) Output.
- E) Measuring element connection.



Lx - 350 mm
y : see codification.

FILTER-REGULATOR FR64 FOR INSTRUMENTS AIR SUPPLY

The series here described, are designed for air supply of pneumatic instruments, offers excellent performance, easy mounting and guarantees years of trouble-free operation.

General

Regulator Unit

Materials

Body and upper cover	: die cast aluminium AL UNI 4514 epossidic painted (RAL 7000).
Diaphragm	: nitrilic rubber.
Drain valve	: AISI 303.
Control valve spring	: stainless steel.
Range spring	: carbon steel.

Note: there is no copper (pure or in alloy) in the other materials used.

Regulation

By knob or hexagonal head screw.

Connections

Air connections	: 1/4" NPT f.
Output gauge connection	: 1/8" NPT f.

SPECIFICATIONS

Max supply pressure	: 18 bar (250 psi).
Filter-regulator output pressure range	: between 0,35 and 7 bar (5 an 101 psi).
Regulator output pressure range	: between 0,35 and 2,5 bar (5/35 psi)
Effect of supply pressure variation	: 0,35 mbar/bar (0,005 psi/psi).

Environment conditions

Storage temperature	: -20 - +90°C.
Operating temperature	: -20 - +80°C.
Humidity	: 5 - 95%.

Weights: base regulator 0,4Kg; basefilter-regulator 0,5Kg;valve 0,150 kg

FILTER UNIT

Materials

Filter housing	: die cast aluminum painted
Filter element:	: AISI 303/304.
Filtration grade	: 10 micron, standard
Impurities blow-out	: by petcock



3-Way Pneumatic Valve serie L30

Technical data

Valve body

Type: globe, three way

Connections: flanged UNI 2223/29 PN16; 40

Materials

- cast iron G25
- carbon steel ASTM A216 WCB
- stainless steel ASTM A351 CF8M

Bonnet

- normal
- finned ($\leq 300^{\circ}\text{C}$)
- extended

Bonnet packing

- ptfе coal graphite rings
- Teflon/graphite asbestos
- graphite
- bellows seal(6 bar / 350°C)

Trim

plug execution

- V ported

contoured

- linear
- On-off

Cv value: see table 1

Rangeability: 1/25

Seat/plug seal

- metal to metal
- resilient

Leak-rate

- CL. II ANSI B16.104 (metal seal)
- CL. VI ANSI B16.104 (resilient seal)

Guide: N 2. Upper

Material

- plug: AISI 316
- seat: AISI 316
- guide bushing: AISI 440 C

Actuator

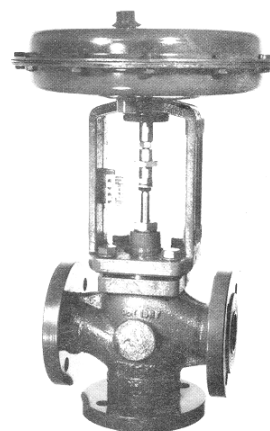
Type: diaphragm

Hand-wheel (on request)

- top
- side

Action: reversable

(without top hand-wheel)



Spring ranges: see table 1

Material: - diaphragm: neoprene linen reinforced

- yoke: cast iron
- casing: steel plate

Air connection: 1/4NPT.F.

Supply pressure: see table 1_

Particular features

Valve body

connections:

- flanged ANSI B16.5 125 FF/150-300RF
- S.W. according to ANSI B16.11
- B.W. according to ANSI B16.25

Materials

- steel A352 LCB(for low temperature)
- steel A217 WC9 - hastelloy
- others on request

Bonnet

- finned ($>300^{\circ}\text{C}$)

Seat/plug/guide materials

- AISI 316 stellited - solide stellite
- hastelloy - others on request

Seat/plug seal: CL V ANSI B16.104(metal seal)

Actuator:

- reinforced execution: supply Pressure max 6 bar
- diaphragm: silicon rubber linen reinforced ($-50/+130^{\circ}\text{C}$)

Material

yoke: steel-stainless steel

plates: stainless steel

Table 1

Max. Allowable Differential Pressure (bar)

Stroke (mm)	DN S I Z E (mm)	S e d (mm)	K v s	Cv	Flow tending to open																		
					Actuators diameter (mm)																		
					φ200				φ280				φ330				φ380						
					Input pressure (bar)																		
					1,4	1,8	-	1,4	1,8	2,5	1,4	1,8	2,5	-	1,4	1,8	2,5	3	-	-	-	-	
					Spring ranges (bar)																		
0,2	0,4	-	0,2	0,4	0,6	0,2	0,4	0,6	0,8	-	0,2	0,4	0,4	0,6	0,6	0,8	-	-					
1	1,2	-	1	1,2	1,8	1	1,2	1,6	1,6	-	1	1,2	2	1,8	2,2	2,4	-	-					
15	20	20	1,2 2,15 4,2 7,24 8,4	1,45 2,5 4,9 8,4	4,9	15	-	12	31	40	21	40	-	-	-	32	40	-	-	-	-	-	-
	25	25	3,1 4,6 7,24 11,2 13	3,6 5,4 8,4 13	2,5	9	-	7	19	31	12	30	-	40	-	20	40	-	-	-	-	-	-
	32	32	7,24 13 18	8,4 15 21	1	5	-	4	11	18	7,5	18	-	39	-	11	26	26	40	40	-	-	-
	40	40	11,2 20,2 27,5	13 23,5 32	0,15	2,8	-	2	6,7	11	4,3	11	-	24	-	7	16	16	26	26	-	-	-
22	50	50	18 30 43	21 35 50	-	-	-	-	-	-	2,4	6,7	11	-	-	4,2	10	10	16	16	22	-	-
	65	60	25,8 43 63,3	30 50 73,5	-	-	-	-	-	-	2,4	4,5	7,5	-	-	2,7	7	7	11	11	15	-	-
34	80	70	38,7 65 95,6	45 75,5 111	-	-	-	-	-	-	-	-	-	-	-	1,7	4,3	4,9	8	8	11	-	-
	100	90	56 95,6 142	65 111 165	-	-	-	-	-	-	-	-	-	-	-	0,8	2,7	2,7	4,6	4,6	6,5	-	-
50	125	112	86 159,5 215	100 175 250	-	-	-	-	-	-	-	-	-	-	-	0,4	1,6	-	2,2	-	-	-	-
	150	135	120,4 210,7 301	140 245 350	-	-	-	-	-	-	-	-	-	-	-	0,2	1	-	1,5	-	-	-	-



* Standard Features

Table 2 Working Limits (1)

Cast iron	PN 16	water	16 bar: 120°C
		water	16 bar: 120°C / 13bar: 180°C
Steel and Stainless(1)	PN 16	Thermal oil (2)	16 bar: 120°C / 13bar: 180°C / 11bar:300°C*
		water	40 bar: 120°C / 32 bar: 220°C / 32bar: 230°C*
	PN 40	water	40 bar: 120°C / 32 bar: 220°C / 32bar: 230°C*
		Thermal oil (2)	22 bar: 220°C / 28 bar: 300°C / 21 bar: 400°C*

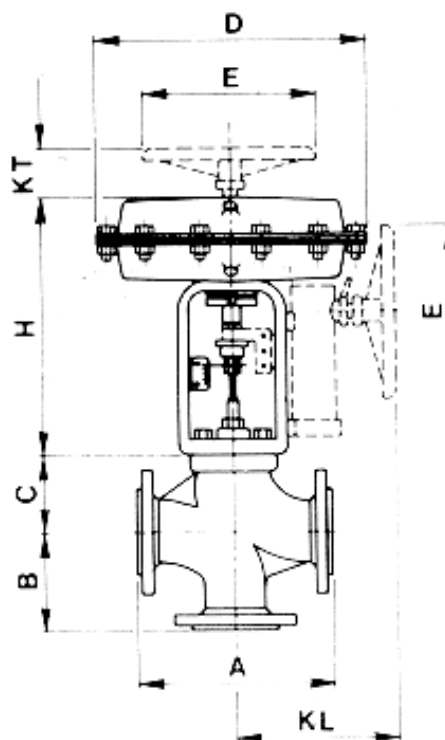
(1) Max. Differential pressures are given in Table 1

* No standard bonnet

Overall Dimensions (mm)

DN	20/25	32	40	50	65	80	100	125	150
PN	16/40								
A	150/160	180	200	230	290	310	350	400	480
B	80/85	100	105	120	130	140	150	200	210
C	std. bonnet	68	84	84	90	104	143	159	237
	finned bonnet(≤300°C)	177	192	238	261	276	355	385	440
	bellow seal (6 bar/350°C)	171	185	185	225	239	342	325	464
	extended (-10/-60°C)	422	431	431	458	469	565	585	690
	extended(-60/-200°C)	547	602	602	649	649	660	667	840
D	200			-					
	280			-					
	330			-					
	380/A			380/B		380/C		380/D	

D	H	E	KT	KL
200	300	125	155	220
280	300	175	155	220
330	305	175	155	220
380/A	320	225	186(d) 140(i)	260
380/B	400	225	186(d) 147(i)	260
380/c	480	225	200(d) 179(i)	260
380/D	480	225	220(d) 179(i)	260



Note: Three way valve L-30 with electric actuator is also available.

3-Way Valve with Pneumatic Actuator Series N-90

Technical data

Valve body

Type: 3 way

Service: Mixing or Diverging

Size: diam. 125 to 400 mm

Connections: flanged UNI 2223/29, rating 16 bar

Materials: cast iron G25

Bonnet

Type: Standard

Packing: Nitrile-rubber "O-Rings"

Trim

Cv value: see table 1

Rangeability: 1/25

Flow characteristic: Linear

Seats: Manufactured on body

plug: Cylindrical sector

Seat / plug seal

-metal to metal

-leak rate 2% max Cv

Material:

- plug: bronze B10

- seat: as body

-shaft: AISI 316

Actuator

Type: diaphragm

Action: Direct. The plug rotation is reversible changing the mechanism position

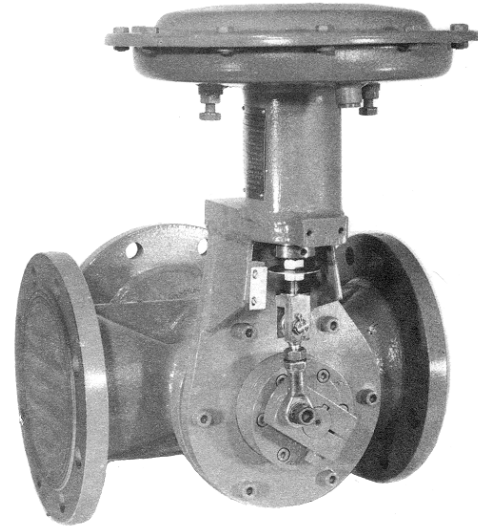
Spring range: 0,2-1 bar, 3-15 psi

Material:

- diaphragm: neoprene linen reinforced

- yoke: cast iron

- casing: sheet steel



Particular features

Valve body

Material: carbon s. ASTM A 216 gr WCB
bronze ASTM 148 gr D
ASTM A 351 CF8M (AISI 316)

Flange connections:

- UNI 2223/29, PN6 / PN10

- ANSI 125 FF/ 150 RF

Trim material

Seats: AISI 316 machined on internal jacket

Plug: ASTM A 351 CF8M; ASTM B 148 gr D

Paking: According to process fluid

Actuator

- diaphragm: silicon rubber linen reinforced (-50/+130°C)

Accessories

- positioner

- electric and pneumatic limit switches

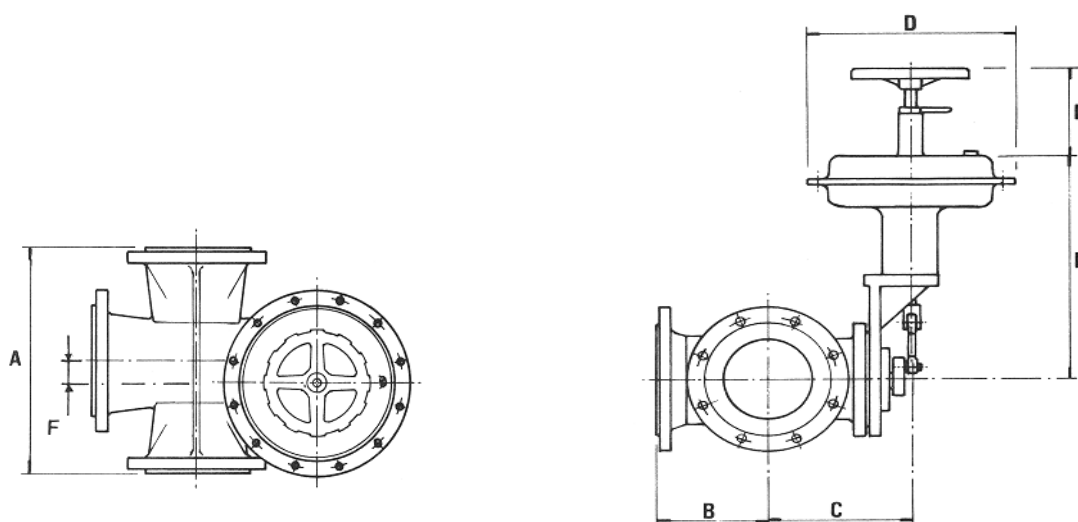
- lock-up valve

- mechanical stroke limit stop

- air filter regulator

Table 1

DN	125	150	200	250	300	350	400
Cv	260	580	1000	1600	2300	3100	3100
KVS	224	500	862	1379	1983	2672	2672
A	386	408	458	563	610	713	765
B	188	200	225	275	300	350	375
C	240	240	270	270	350	350	351
D	330	330	380	380	380	450	450
F	28	28	35	35	35	47	47
H	400	400	480	480	480	580	580
K	160	160	210	210	210	210	210
Weights (kg)	80	100	160	228	350	473	503
Extra Top Handwheel (kg)	2,5	2,5	5	5	5	5	5



Working Limits: 10 bar: 150°C with water, lube oil, others no inflammable or dangerous liquids

Max. Allowable dp: Size 125 mm: 2 bar
Size 150 to 250 mm: 1,5 bar
Size 300 to 400 mm: 1 bar

Note: Three way valve N-90 with electric actuator is also available.