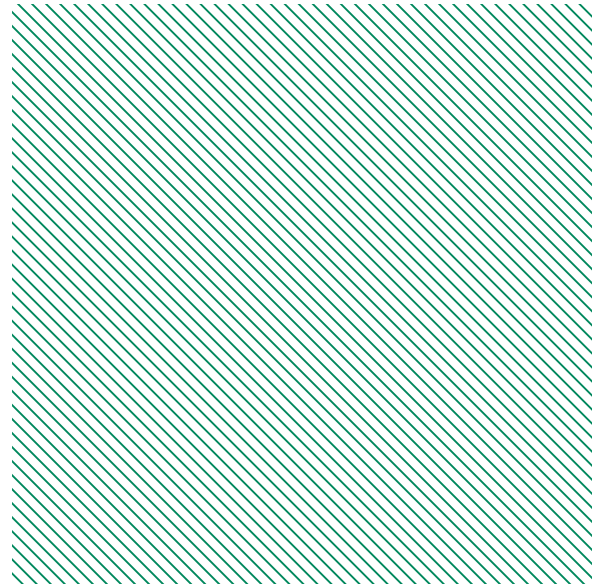




**TORMENE
GROUP**

www.tormenegroup.com



TA-935

Axial Type Pressure Regulator & Safety Shutoff Valve



Engineering eXcellence In Measurement Packages

www.eximpmeasurement.com

TA-935

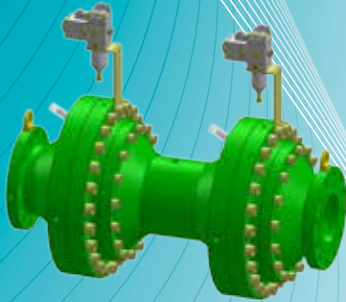
TA-935



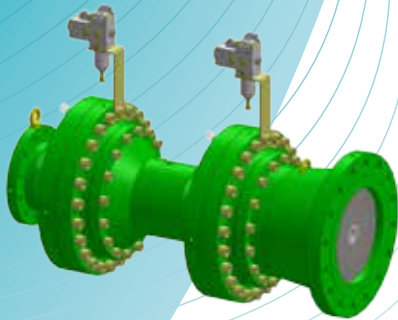
TA-935 EXPANDED OUTLET



TA-935 ACTIVE+MONITOR



TA-935 ACTIVE+MONITOR
EXPANDED OUTLET



TA-935 SAFETY
SHUTOFF VALVE



Products Range

INDEX

TA-935 FAMILY	... 4
APPLICATION	... 4
CONFIGURATIONS	... 5
TECHNICAL SPECIFICATIONS TA-935	... 6
TA-935 MATERIALS	... 6
PILOTS 980 SPRING TABLE	... 7
TA-935 SSV PRESSURE SWITCH SPRING TABLE	... 7
TA-935FC+FC+SLC1 OPERATING PRINCIPLE	... 8
TA-935 FO OPERATING PRINCIPLE	... 10
TA-935 SSV OPERATING PRINCIPLE	... 12
FEATURES	... 16
MONITOR	... 16
TA-935 ACCESSORIES	... 17
INSTALLATION SCHEMATICS	... 20
DIMENSIONS	... 22
FLOW COEFFICIENT TABLE	... 27
SIZING	... 28
TA-935 PART NUMBERING FOR ASSEMBLED UNITS	... 30

TA-935 FAMILY APPLICATION

TA935 family of axial flow pressure regulators and Safety Shutoff Valves were designed in order to meet the requirement of several markets where the advantages and features of axial type pressure regulators are appreciated.

The design of this range of products was based on our experience of supplying thousands of TA956 regulators that are currently in service World-wide.

Most of the critical parts of the New TA935 family are in common with the successful TA956 family regulators and SSV.

TA935 axial flow is providing also the following features:

- High flow rat;
- Balanced valve sleeve;
- Low number of components;
- Modular design;
- Increased outlet flange size;
- Increased silencing options;
- Fail Close & Fail Open designs;
- Integrated 2 in 1 functions FC+FC, FC+FO;
- Safety Shutoff Valves.

Multi-function units allow exceptionally compact configurations.

The modular design allows a wide variety of configurations to suit the most demanding applications in gas transmission, gas supply to industrial power plant, city gates, distribution utility systems, industry installations, etc.

TA935 pressure regulators are designed to be used with non-corrosive and filtered natural gas. Upon request other gases and different process conditions may be acceptable with specific choice of materials.

TA935 FC+FC, FC+FO are pilot operated double function gas pressure regulators. With sleeve piston type regulator operation (fail open or fail close types) suitable for high, medium, and low pressure applications.

TA935 SSV will go to fully closed position in case of:

- Downstream pressure higher than the MAX set point, Over-pressure Protection;
- Downstream pressure lower than the MIN set point, Under-pressure Protection.

TA935 pressure regulators and SSV are in accordance with the following standards:

- Pressure Equipment Directive (PED) 2014/68/EU
- DIN EN 334 (01.07.2009)
- DIN EN 14382 (01.07.2009)

CONFIGURATIONS

CONFIGURATION	STANDARD OUTLET FLANGE		LARGER OUTLET FLANGE	
	NOT SILENCED	SILENCED	NOT SILENCED	SILENCED
Regulator FC	935FC	935FC+SLC1	935FCLO	935FCLO+SLC1 935FCLO+SLC2
Regulator FO	935FO	935FO+SLC1	935FOLO	935FOLO+SLC1 935FOLO+SLC2
Monitor FC + Regulator FC	935FC+FC	935FC+FC+SLC1	935FC+FCLO	935FC+FCLO+SLC1 935FC+FCLO+SLC2
Monitor FC + Regulator FO	935FC+FO	935FC+FO+SLC1	935FC+FOLO	935FC+FOLO+SLC1 935FC+FOLO+SLC2
Safety Shutoff Valves	TA935SSV	-	-	-

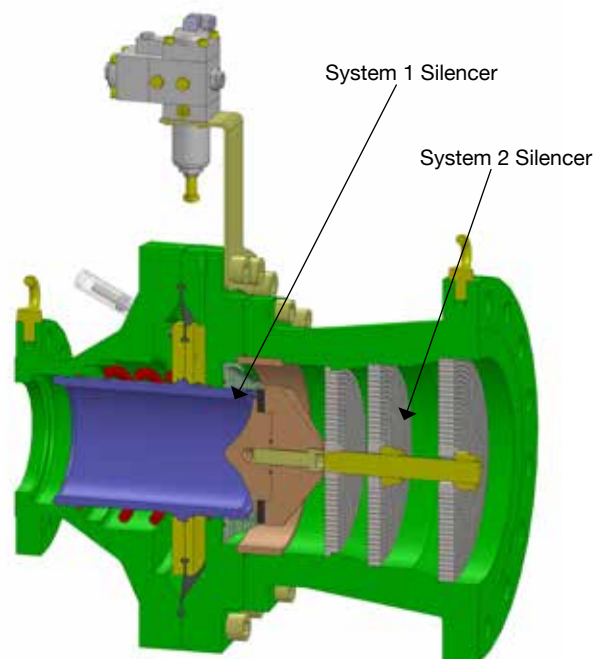
Silencing is accomplished by the use of two independent systems.

System 1 uses an internal silencer at the valve opening. This is the area with highest gas velocity, so gives noise reduction at the point of noise generation.

System 2 is an additional multi-stage silencer that is integrated into the “Expanded Outlet” flange design. System 2 has noise reduction at valve opening and a complimentary multistage silencer in the expanded outlet.

Flow limitation and regulator dedication to specific applications, where regulation requires a reduced C_g , is done utilising System 1 type silencers.

The combination of the two silencer types is capable of achieving the highest noise reduction in a compact configuration.



TECHNICAL SPECIFICATIONS TA-935

Maximum Inlet Pressure p_{max}	100 bar (according to flange rating)			
Outlet pressure range Wd	0.3 to 90.0 bar			
Pressure difference between inlet and outlet	$\Delta p_{min} = 0.5 \text{ bar (FC)}$; $\Delta p_{min} = 1.85 \text{ bar (FO)}$; $\Delta p_{max} = 100 \text{ bar}$			
Nominal diameter and CG value	2" (DN 50) CG=2300 3" (DN 80) CG=4700 4" (DN 100) CG=8400 6" (DN 150) CG=16600 8" (DN 200) CG=28500 10" (DN 250) CG=46000 12" (DN 300) CG=66300			
Type of connection	Flanges ANSI 150, ANSI 300, ANSI 600 (PN 16,25,40,64,100 on request)			
Accuracy class and closing pressure category	Up to 1% depending on size and pressure range			
	With Pilot	Outlet pressure range Wd	Accuracy class	Closing pressure category
	TA-989FC	41 ... 90 bar	AC 1 %	SG 5%
	TA-981FCHP	20 ... 60 bar	AC 1 %	SG 5%
	TA-981FC	0.8 ... 43 bar	AC up to 1%	SG up to 2.5%
	TA-981FCR	0.3 ... 1.2 bar	AC 5 %	SG 2.5%
	TA-988FO	41 ... 74 bar	AC 1 %	SG 5%
	TA-987FOHP	20 ... 60 bar	AC 1 %	SG 5%
TA-987FO	1 ... 33 bar	AC up to 1%	SG up to 2.5%	
Lock Up pressure category	SZ 2.5 %			
Operative temperature range	-20 °C to +60 °C (-40°C to +60°C available on request)			
Operation and strength according to	EN 334, EN 14382, PED 2014/68/EU, ANSI B16.5, ANSI B16.34, EN 12186, ANSI/ASME B31.8, ANSI/FCI 70.2, ISA 75.05, ISA 75.17, ISA RP75.06, IEC 61511			
EX protection	Since the device is not fitted with potential ignition sources of its own, it is not subject to ATEX 95 regulations (all used electronic accessories meet ATEX requirements).			
Accessories	Flow limitation, Remote SP control, Station Automation, Spacer for Outlet/Inlet, Regulator Position Transmitter, Regulator O/C Proximity Switch, SSV Open Proximity Switch, Remote SSV Trip, Three-way Valve for Checking Purpose			

TA-935 MATERIALS

Body	ASTM A216 WCB/WCC, ASTM A105 (ASTM A 352LCC/A 350 LF2 ON REQUEST)
Diaphragm housing	ASTM A216 WCB/WCC, ASTM A105 (ASTM A 352LCC/A 350 LF2 ON REQUEST)
Valve	ASTM A 182 F6/ASTM A105 ENP (ASTM A 350 LF2 ENP on request)
Seat	ASTM A105 ENP (ASTM A 350 LF2 ENP on request)
Diaphragm	Nitrile rubber with nylon fabric
Seals	Nitrile (NBR) or fluoroelastomer (FKM)
Pilot	Alluminium 6082 T6
SSV device	Steel, Brass, Alluminium

PILOTS 980 SPRING TABLE

PILOT	Pilot Spring			Pressure	
	Nr	Code	Color	Min. [bar]	Max. [bar]
TA-981FC-R	1501	403	White	0.300	1.200
TA-981FC	1502	404	Green	0.800	2.800
TA-981FC	1503	405	Yellow	1.500	7.000
TA-981FC	1504	406	L.Blue	4.000	14.000
TA-981FC	1505	406	Blue	8.000	20.000
TA-981FC	1506	416	Red	15.000	33.000
TA-981FC	1507	417	Black	22.000	43.000
TA-981FCHP	1514	424	Black	20.000	30.000
TA-981FCHP	1515	425	Pink	30.000	44.000
TA-981FCHP	1516	426	Brown	44.000	60.000
TA-989FC	1516	426	Brown	41.000	74.000
TA-989FC	1526	436	Pink	55.000	90.000
TA-987FO	1508	418	White	1.000	3.200
TA-987FO	1509	419	Green	3.200	5.200
TA-987FO	1510	420	Yellow	5.200	8.200
TA-987FO	1511	421	L.Blue	8.200	17.000
TA-987FO	1512	422	Blue	12.000	25.000
TA-987FO	1513	423	Red	17.000	26.000
TA-987FO	1514	424	Black	25.000	33.000
TA-987FOHP	1514	424	Black	20.000	30.000
TA-987FOHP	1515	425	Pink	30.000	44.000
TA-987FOHP	1516	426	Brown	44.000	60.000
TA-988FO	1516	426	Brown	41.000	74.000
TA-988FO	1526	436	Pink	55.000	90.000

TA-935 SSV PRESSURE SWITCH SPRING TABLE

Head	Wdo	Wdu	Accuracy Class
CX677	0.015 ... 1.2 bar	0.01 ... 1 bar	10 ... 2.5
CX640	0.2 ... 10 bar	0.15 ... 4 bar	5 ... 1
CX630	1 ... 18 bar	0.8 ... 7 bar	2.5 ... 1
CX615	3 ... 95 bar	2 ... 29 bar	2.5 ... 1

TA-935FC+FC+SLC1

OPERATING PRINCIPLE

ACTIVE REGULATOR

The diaphragm is directly connected to the sleeve of the regulator and is subject to the following forces.

- Motorizing pressure P_m on the motorizing chamber side of diaphragm. Force opening the sleeve.
- Regulated pressure P_d on the regulated pressure chamber side of diaphragm. Force closing the sleeve.
- Regulator spring. Force closing the sleeve.

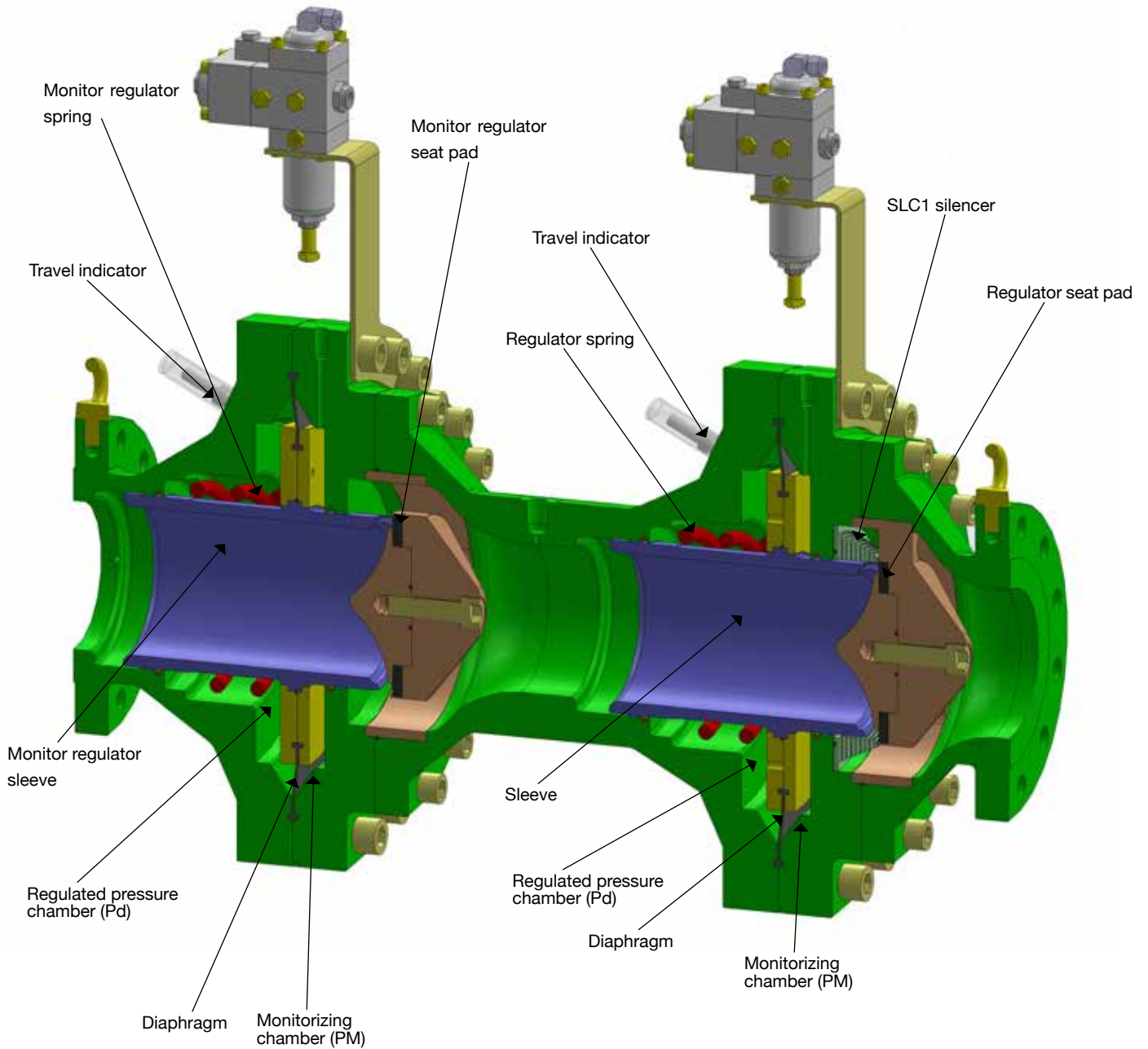
The equilibrium of these forces controls the position of the sleeve against the valve seating pad.

The pilot provides the motorizing pressure P_m , the spring force is proportional to the travel of the sleeve and the regulated pressure is the variable that we wish to control.

As pressure in the downstream piping decreases, following an increase demand of flow, the pilot increases the motorizing pressure that moves the sleeve further open, increasing the gas flow.

When the required flow at the set pressure is achieved, the system will reach a new equilibrium. A reduction in flow demand increases the downstream pressure. The pilot will reduce the motorizing pressure so that a new equilibrium is reached at a reduced flow after the sleeve has closed slightly.





Monitor regulator

Active regulator

TA-935 FO OPERATING PRINCIPLE

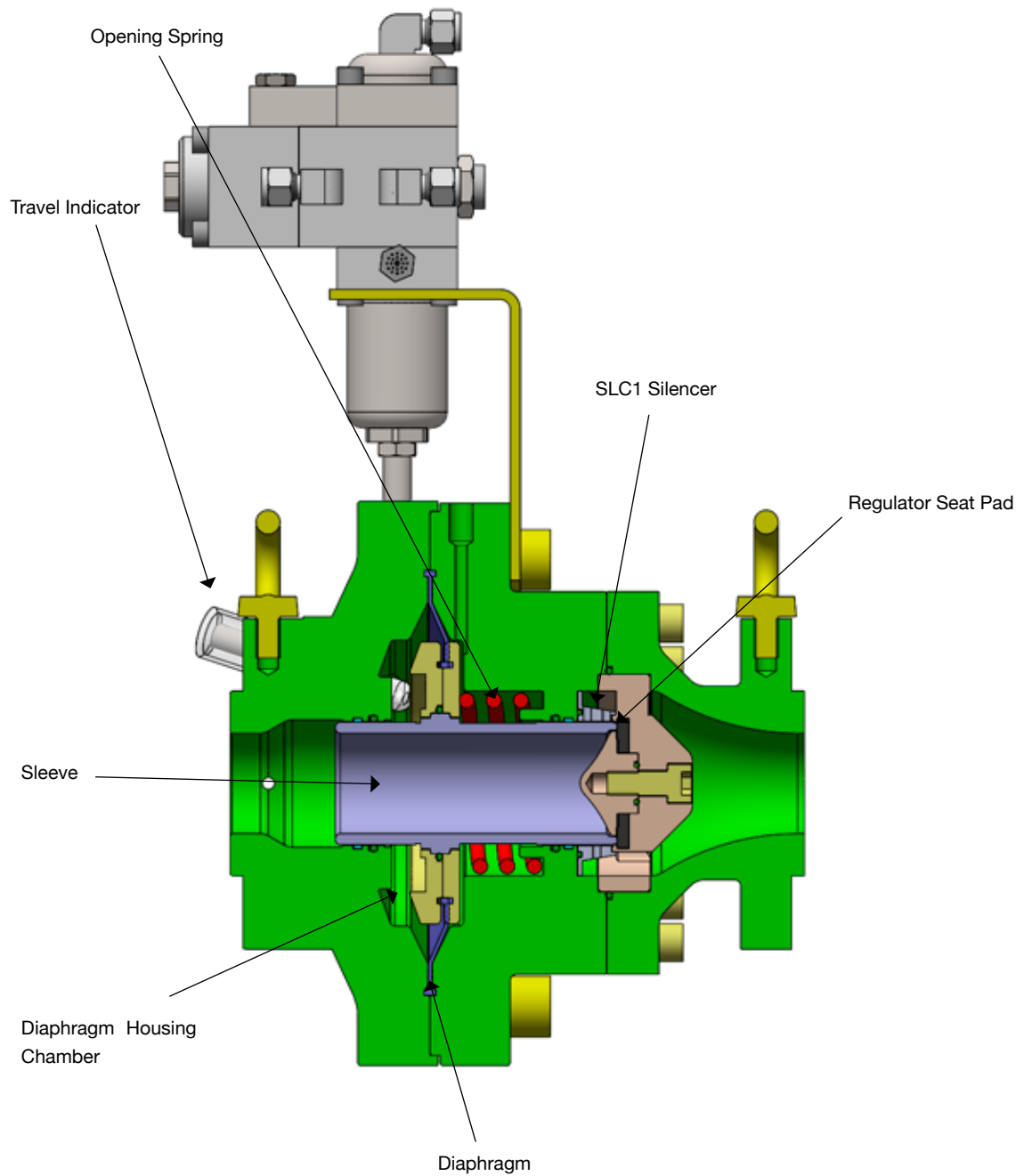
The Tormene TA 935 FO is a Fail Open type pressure regulator, this means that the main valve will move to the fully open position in the event of diaphragm rupture of main valve, rupture of the pilot diaphragm or supply pressure to pilot is not available.

This pressure regulator uses a steel sleeve-piston as the control valve. A spring forces the control valve to the fully open position.

The pilot takes gas supply from the high pressure upstream gas. It generates an intermediate pressure called motorisation which is sent to the upper chamber of the main valve diaphragm, the same pressure is then used to generate a dumping pressure.

When the downstream pressure increases because of a reduction in flow rate the pilot closes slightly and the dumping pressure is reduced so the motorisation pressure prevails and starts to close the main valve therefore re-establishing the required controlled outlet pressure.

An increased flow rate tends to reduce the downstream pressure, the pilot opens a little and the dumping pressure increases, forcing the main piston valve to open a little therefore re-establishing the controlled outlet pressure level.



TA-935 SSV OPERATING PRINCIPLE

This type of valve is used as a safety measure to shut off the gas flow in case of the downstream pressure being higher than the MAX set point or lower than the MIN set point.

This valve is equipped with a spring loaded valve that is maintained in the open position by a mechanism that is controlled by a pressure switch.

The pressure switch may be equipped with one or more of the following control modes:

- minimum pressure control;
- maximum pressure control;
- minimum and maximum pressure control;
- manual control (local button);
- remote control with 3-way solenoid valve(optional).

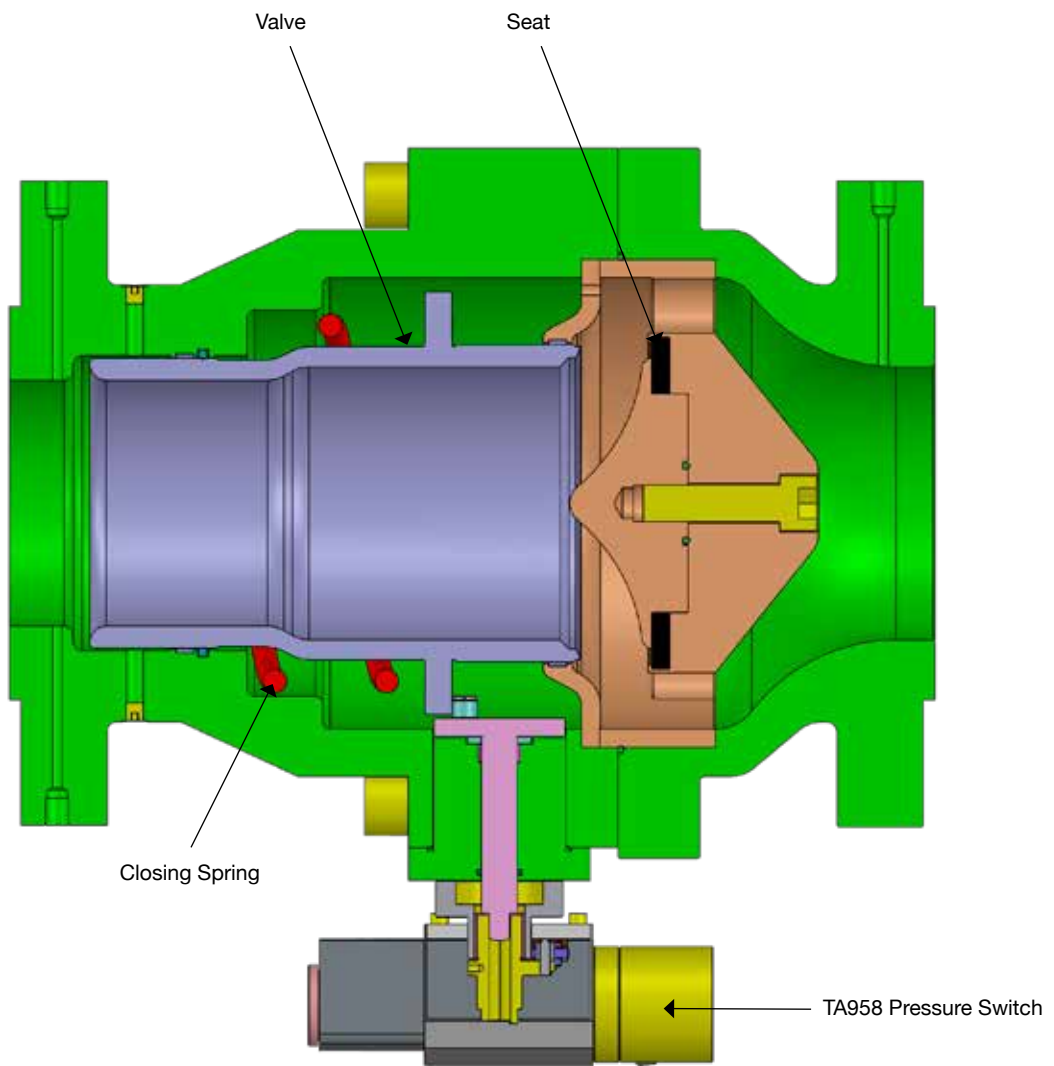
Once the set point (according to the installed spring) is reached, the pressure switch releases the latching mechanism and operates closing the valve. The valve is fully balanced therefore its operation is not affected by pressure changes. In the fully closed position the valve sealing force is also increased by differential pressure.

The system may be re-latched to the open position only when the pressure conditions allow and only by operating the latching lever to re-set it to the open position using a suitable wrench.

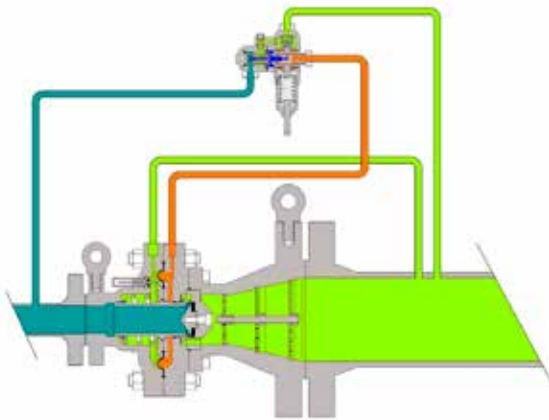
Remote operation is possible by installing an optional solenoid valve that in normal conditions would maintain the connection of the pressure switch head to the outlet pressure being monitored.

When the valve is remotely tripped it will connect the pressure switch head to atmosphere therefore venting the pressure and generating a minimum pressure trip operation.

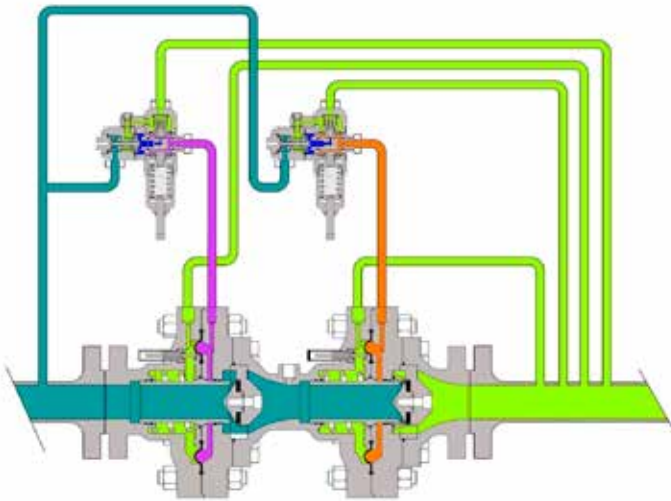
The SSV can be always closed with the manual button.



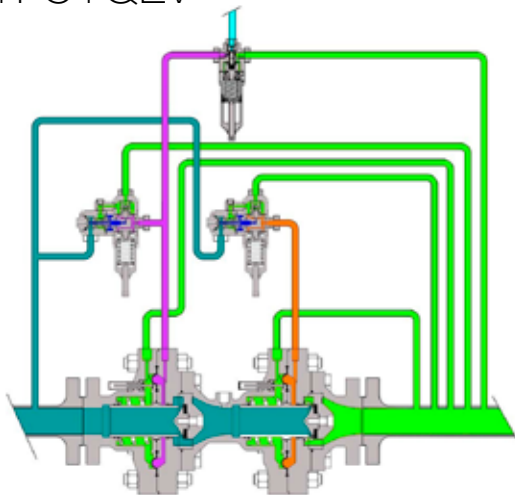
TA-935-FCLO



TA-935-FC+FC



TA-935-FC+FC+QEV





FEATURES

- Body specifically designed for high capacity with low noise generation;
- Completely self operated using the inlet gas pressure energy;
- Fully balanced control valve;
- Extremely high rangeability ;
- Suitable for high pressure reduction applications;
- Local position indicator with magnetic drive, no possibility of leakage to atmosphere;
- Available with Spacer for Outlet/Inlet;
- Available with internal silencer;
- Available with Open/Close limit switch suitable for classified area installation;
- Available with 4-20 mA position transmitter with magnetic drive suitable for classified area installation;
- Available with SSV Open Proximity Switch, Remote SSV Trip, Three-way Valve for Checking Purpose.

MONITOR

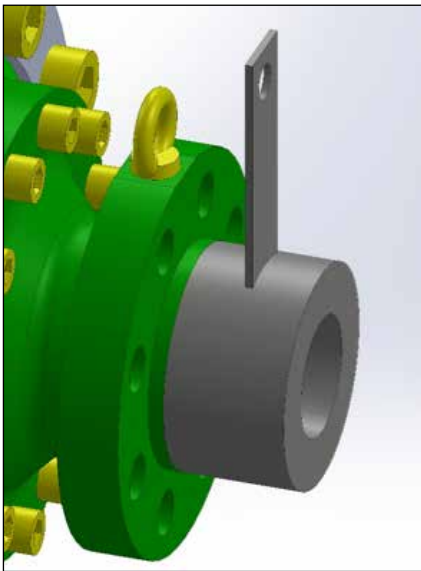
The monitor is an emergency regulator used in a pressure regulating system as a safety device. Its duty is to take over the control of the downstream pressure in case of a malfunction of the active regulator.

The monitor is set at a controlling pressure slightly higher than of the active regulator, so in normal operating conditions it stays fully open. The active regulator provides normal pressure control.

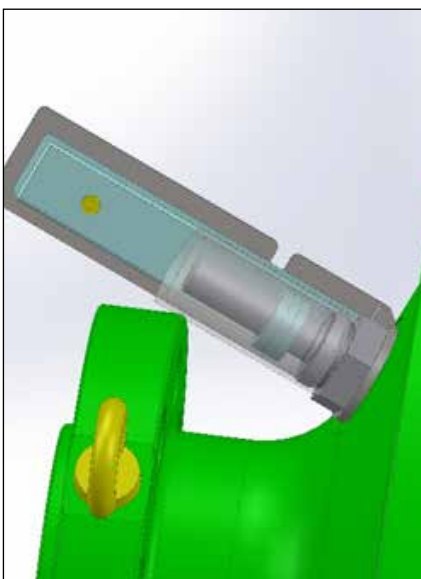
The monitor regulator can be of the “fail open” or “fail closed” type.



TA-935 ACCESSORIES



SPACER FOR OUTLET (REGULATORS)
OR INLET (SSV)



REGULATOR POSITION TRANSMITTER

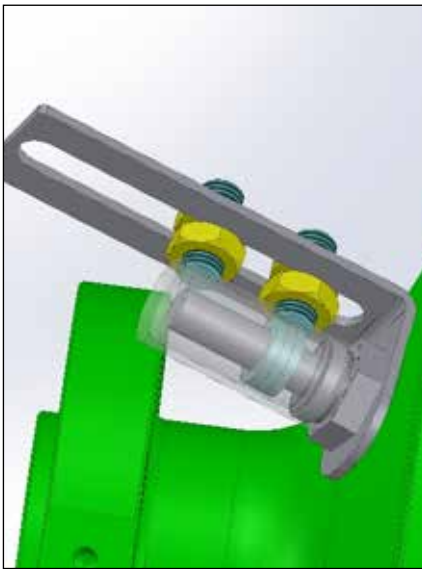
Remote transmission of pressure regulator position through contactless magnetic drive position transmitter. (Tormene model MAT01)

This transmits a 4-20 mA as an indication of the regulator valve position.

It can be retrofitted to existing installations without removing them from service.

ATEX Certified.

TA-935 ACCESSORIES



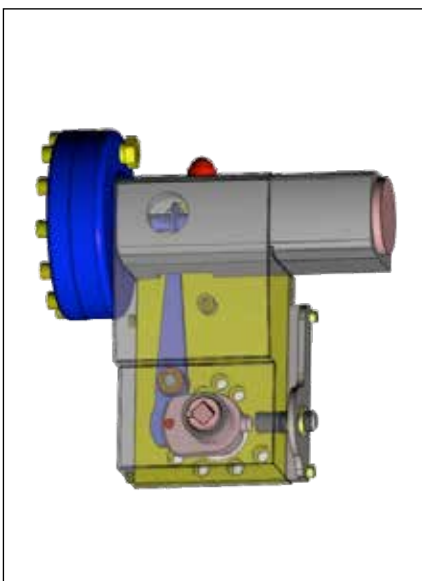
REGULATOR LIMIT SWITCH

Remote transmission of pressure reduction regulator status open / closed.

A limit switch provides a signal of fully closed / fully open position.

A typical installation is based on contact-less reed switches, that may also be retro-fitted on installed equipment.

ATEX Certified



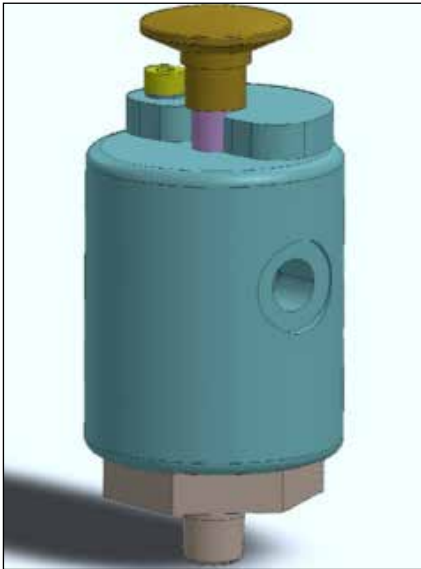
SSV PROXIMITY SWITCH

Remote transmission of Safety Shut-off Valve (SSV) status, Open.

A proximity contactless switch is used to detect the Open position of the SSV.

ATEX Certified.

TA-935 ACCESSORIES



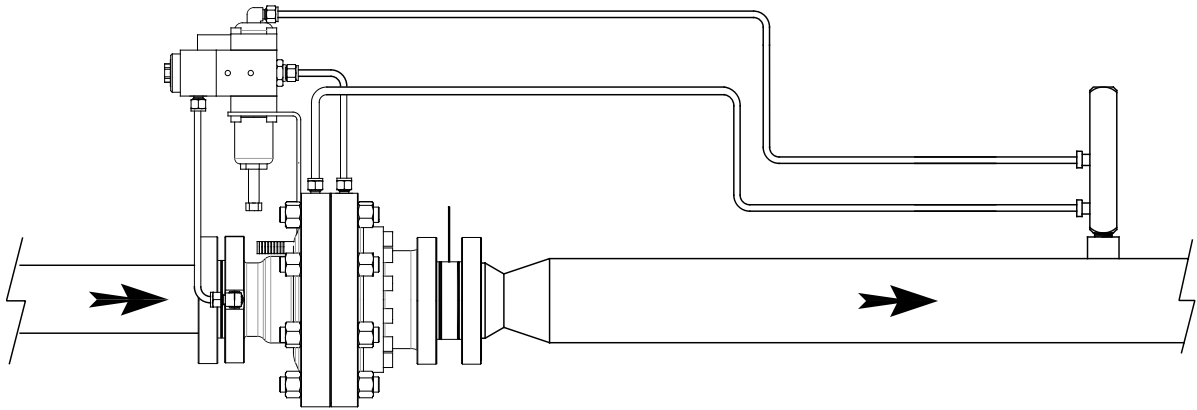
THREE WAY VALVE
FOR CHECKING PURPOSE



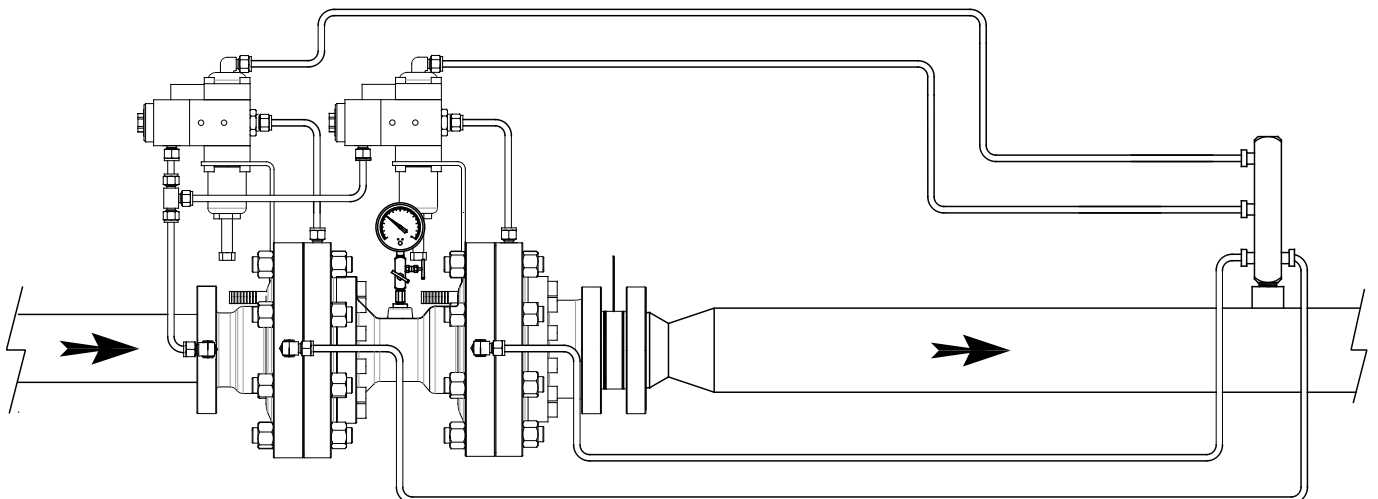
SOLENOID VALVE SSV REMOTE TRIP

INSTALLATION SCHEMATICS

TA-935 FC REGULATOR

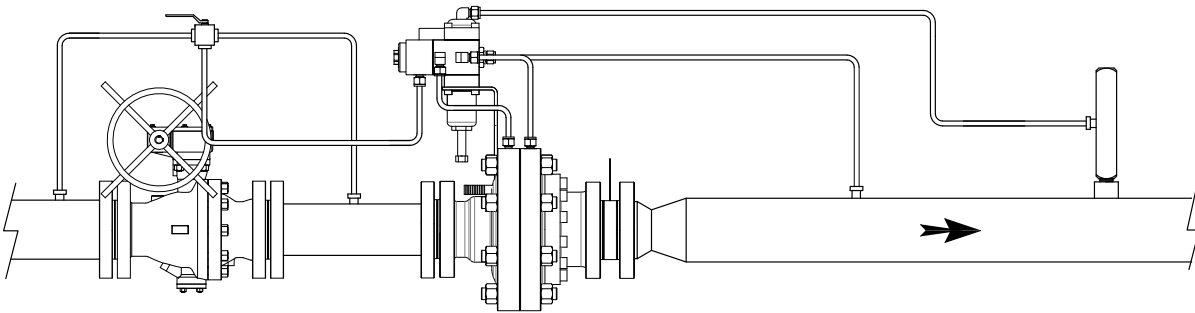


TA-935 FC REGULATOR & TA-935 FC MONITOR

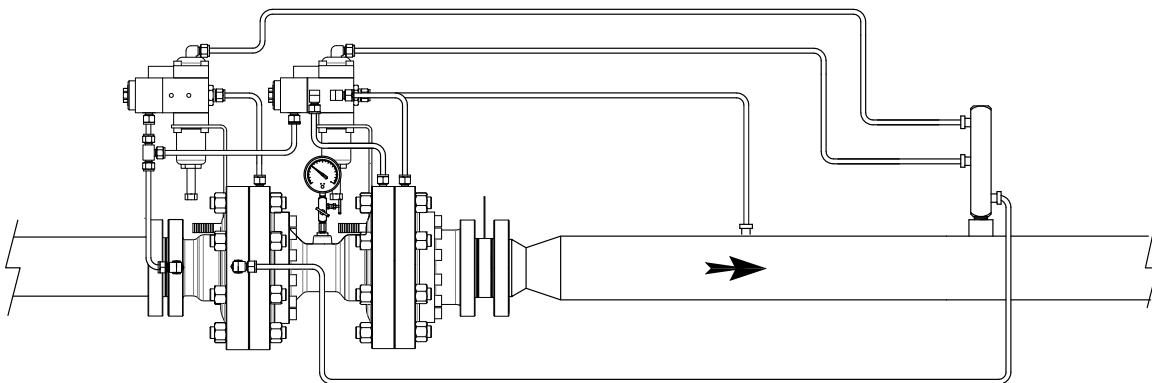


INSTALLATION SCHEMATICS

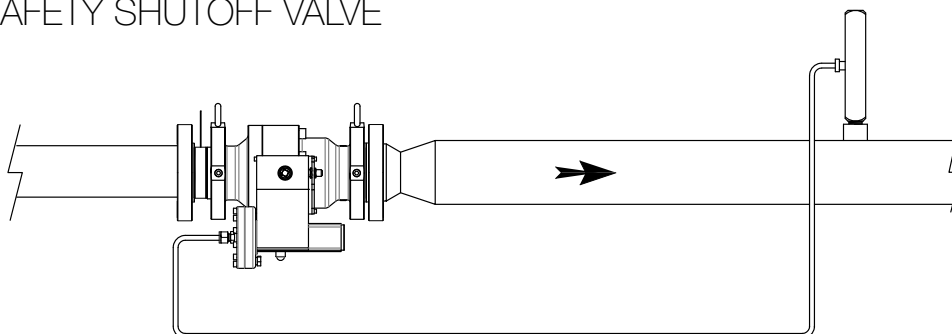
TA-935 FO REGULATOR



TA-935 FC MONITOR + FO REGULATOR

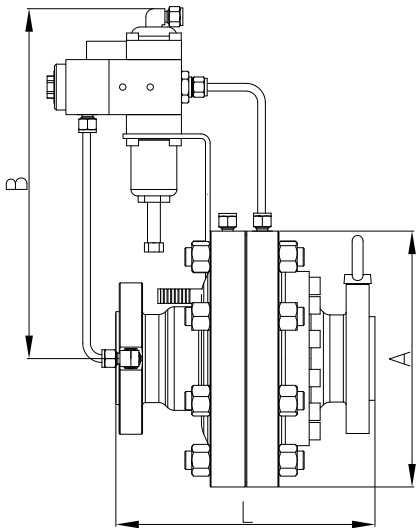


TA-935 SAFETY SHUTOFF VALVE

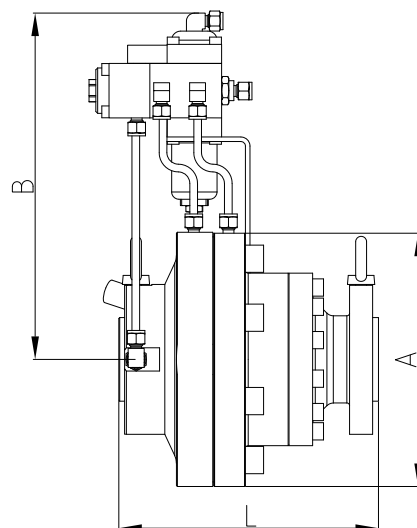


DIMENSIONS

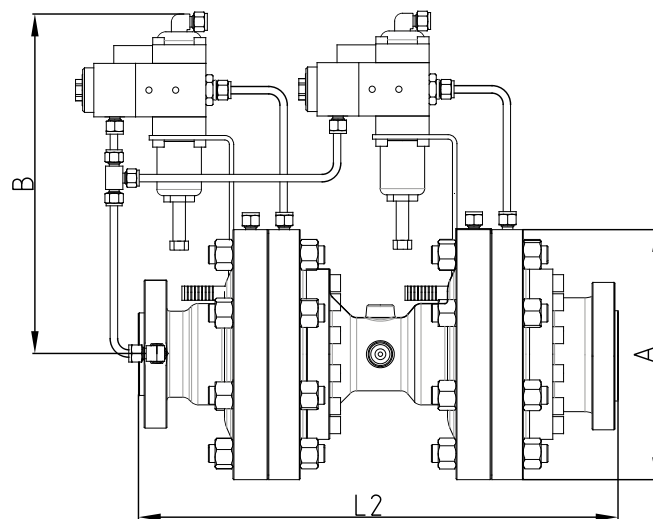
TA-935 FC



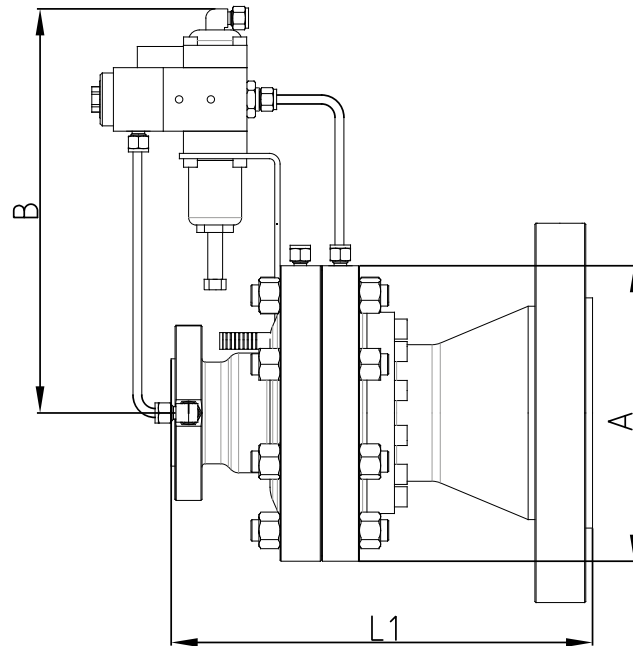
TA-935 FO



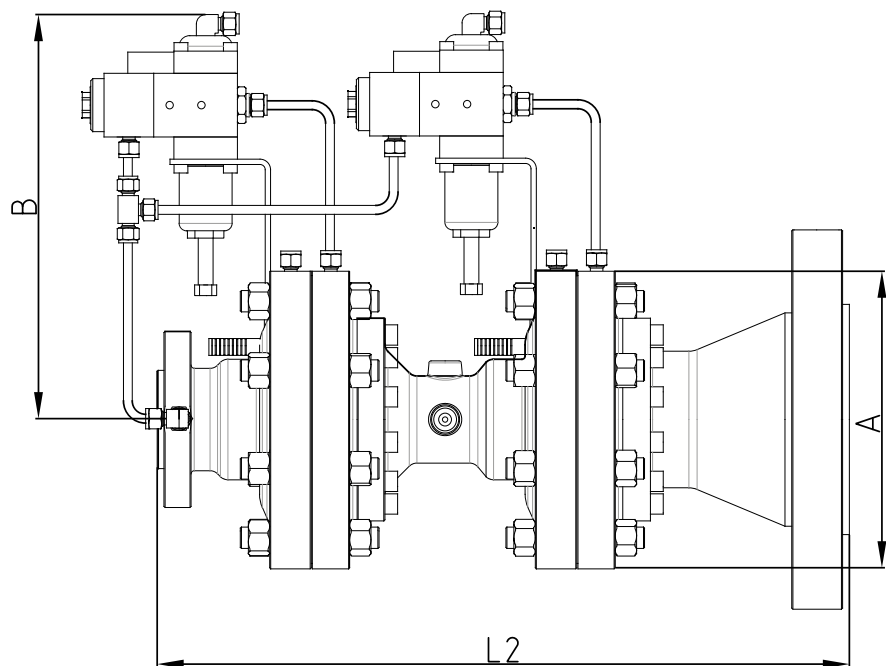
TA-935 FC+FC/FC+FO



TA-935 FCLO/FOLO

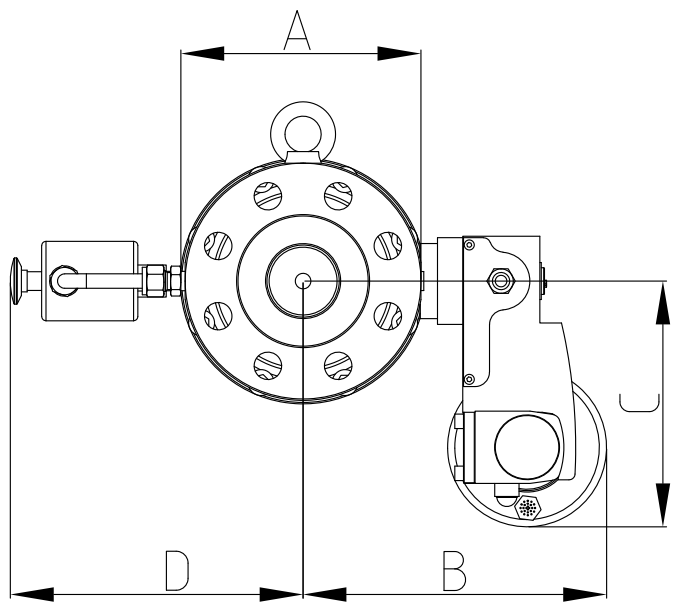
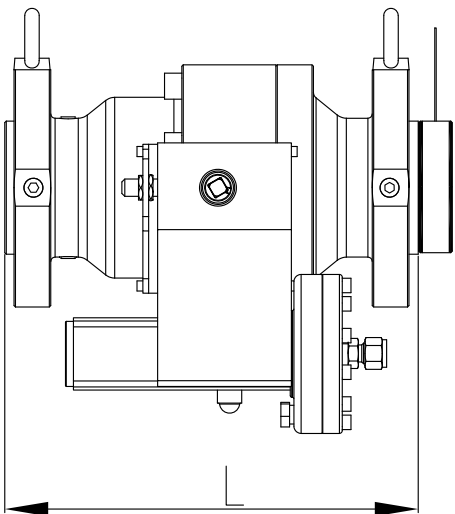


TA-935 FC+FCLO/FC+FOLO



DIMENSIONS

TA-935 SSV



DIMENSIONS (mm) TA-935

Size	FC #150 / PN16 / PN25				Size	FC #300 / PN40				Size	FC #600 / PN64 / PN100			
	L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]
50	254	280	360	38	50	267	280	360	45	50	286	280	360	45
80	298	340	390	100	80	318	340	390	115	80	337	340	390	115
100	352	400	420	130	100	368	400	420	153	100	394	400	420	153
150	451	545	495	295	150	473	545	495	346	150	508	545	495	346
200	543	650	545	600	200	568	650	545	705	200	610	650	545	705
250	673	720	580	860	250	708	720	580	1012	250	752	720	580	1012
300	737	865	655	1220	300	775	865	655	1440	300	819	865	655	1440

Size	FO #150 / PN16 / PN25				Size	FO #300 / PN40				Size	FO #600 / PN64 / PN100			
	L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]
50	254	280	360	44	50	267	280	360	52	50	286	280	360	52
80	298	340	390	110	80	318	340	390	130	80	337	340	390	130
100	352	400	420	150	100	368	400	420	175	100	394	400	420	175
150	451	545	495	330	150	473	545	495	390	150	508	545	495	390
200	543	650	545	660	200	568	650	545	780	200	610	650	545	780
250	673	720	580	950	250	708	720	580	1120	250	752	720	580	1120
300	737	865	655	1350	300	775	865	655	1590	300	819	865	655	1590

Size	FCLO #150 / PN16 / PN25				Size	FCLO #300 / PN40				Size	FCLO #600 / PN64 / PN100			
	L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]
50x150	383	280	360	75	50x150	390	280	360	88	50x150	400	280	360	88
80x250	480	340	390	170	80x250	490	340	390	200	80x250	500	340	390	200
100x250	504	400	420	210	100x250	512	400	420	245	100x250	525	400	420	245
150x300	631	545	495	550	150x300	642	545	495	650	150x300	660	545	495	650
200x400	746	650	545	805	200x400	759	650	545	950	200x400	780	650	545	950
250x500	935	720	580	1220	250x500	953	720	580	1435	250x500	975	720	580	1435
300x600	1023	865	655	1755	300x600	1042	865	655	2070	300x600	1064	865	655	2070

Size	FOLO #150 / PN16 / PN25				Size	FOLO #300 / PN40				Size	FOLO #600 / PN64 / PN100			
	L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]
50x150	383	280	360	80	50x150	390	280	360	96	50x150	400	280	360	96
80x250	480	340	390	185	80x250	490	340	390	215	80x250	500	340	390	215
100x250	504	400	420	230	100x250	512	400	420	270	100x250	525	400	420	270
150x300	631	545	495	590	150x300	642	545	495	695	150x300	660	545	495	695
200x400	746	650	545	870	200x400	759	650	545	1025	200x400	780	650	545	1025
250x500	935	720	580	1310	250x500	953	720	580	1545	250x500	975	720	580	1545
300x600	1023	865	655	1885	300x600	1042	865	655	2220	300x600	1064	865	655	2220

Size	FC+FC #150 / PN16 / PN25				Size	FC+FC #300 / PN40				Size	FC+FC #600 / PN64 / PN100			
	L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]
50	542	280	360	78	50	555	280	360	90	50	574	280	360	90
80	637	340	390	195	80	657	340	390	230	80	676	340	390	230
100	748	400	420	265	100	764	400	420	310	100	790	400	420	310
150	961	545	495	550	150	983	545	495	650	150	1018	545	495	650
200	1155	650	545	1195	200	1180	650	545	1410	200	1222	650	545	1410
250	1427	720	580	1720	250	1462	720	580	2025	250	1506	720	580	2025
300	1558	865	655	2440	300	1596	865	655	2880	300	1640	865	655	2880

Size	FC+FO #150 / PN16 / PN25				Size	FC+FO #300 / PN40				Size	FC+FO #600 / PN64 / PN100			
	L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]
50	542	280	360	85	50	555	280	360	98	50	574	280	360	98
80	637	340	390	210	80	657	340	390	245	80	676	340	390	245
100	748	400	420	280	100	764	400	420	330	100	790	400	420	330
150	961	545	495	585	150	983	545	495	690	150	1018	545	495	690
200	1155	650	545	1260	200	1180	650	545	1485	200	1222	650	545	1485
250	1427	720	580	1810	250	1462	720	580	2135	250	1506	720	580	2135
300	1558	865	655	2570	300	1596	865	655	3030	300	1640	865	655	3030

Size	FC+FCLO #150 / PN16 / PN25				Size	FC+FCLO #300 / PN40				Size	FC+FCLO #600 / PN64 / PN100			
	L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]
50x150	671	280	360	115	50x150	678	280	360	135	50x150	688	280	360	135
80x250	819	340	390	270	80x250	830	340	390	315	80x250	839	340	390	315
100x250	900	400	420	340	100x250	908	400	420	400	100x250	921	400	420	400
150x300	1141	545	495	850	150x300	1152	545	495	1000	150x300	1170	545	495	1000
200x400	1358	650	545	1405	200x400	1371	650	545	1655	200x400	1392	650	545	1655
250x500	1689	720	580	2075	250x500	1707	720	580	2445	250x500	1729	720	580	2445
300x600	1844	865	655	2975	300x600	1863	865	655	3510	300x600	1885	865	655	3510

Size	FC+FOLO #150 / PN16 / PN25				Size	FC+FOLO #300 / PN40				Size	FC+FOLO #600 / PN64 / PN100			
	L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]		L [mm]	A [mm]	B [mm]	Weight [kg]
50x150	671	280	360	125	50x150	678	280	360	145	50x150	688	280	360	145
80x250	819	340	390	280	80x250	830	340	390	330	80x250	839	340	390	330
100x250	900	400	420	360	100x250	908	400	420	425	100x250	921	400	420	425
150x300	1141	545	495	885	150x300	1152	545	495	1041	150x300	1170	545	495	1041
200x400	1358	650	545	1470	200x400	1371	650	545	1730	200x400	1392	650	545	1730
250x500	1689	720	580	2165	250x500	1707	720	580	2555	250x500	1729	720	580	2555
300x600	1844	865	655	3105	300x600	1863	865	655	3660	300x600	1885	865	655	3660



Size	TA935 SSV #150 / PN16 / PN25					
	L [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Weight [kg]
50x50	254	170	210	170	-	29
80x80	298	220	235	170	-	61
100x100	352	290	270	170	-	95
150x150	451	370	310	170	-	239
200x200	543	440	345	170	-	418
250x250	673	530	390	170	-	644
300x300	737	580	415	170	-	974
Size	TA935 SSV #300 / PN40					
	L [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Weight [kg]
50x50	267	170	210	170	203	33
80x80	318	220	235	170	228	67
100x100	368	290	270	170	263	112
150x150	473	370	310	170	303	280
200x200	568	440	345	170	338	480
250x250	708	530	390	170	383	750
300x300	775	580	415	170	408	1080
Size	TA935 SSV #600 / PN64 / PN100					
	L [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Weight [kg]
50x50	286	170	210	170	203	33
80x80	337	220	235	170	228	67
100x100	394	290	270	170	263	112
150x150	508	370	310	170	303	280
200x200	610	440	345	170	338	480
250x250	752	530	390	170	383	750
300x300	819	580	415	170	408	1080

FLOW COEFFICIENT TABLE

DN		SINGLE UNITS			ACTIVE + MONITOR REGULATOR UNITS		
	C1	TA935FC TA935FO NOT SILENCED	TA935FC TA935FO SILENCED SLC1	TA935FC TA935FO SILENCED SLC2	TA935FC+FC TA935FC+FO NOT SILENCED	TA935FC+FC TA935FC+FO SILENCED SLC1	TA935FC+FC TA935FC+FO SILENCED SLC2
50	28	2300	2070	-	2185	1966	-
50x150	28	2300	2070	1966	2185	1966	1888
80	28	4700	4230	-	4465	4018	-
80x250	28	4700	4230	4018	4465	4018	3857
100	28	8400	7560	-	7980	7185	-
100x250	28	8400	7560	7182	7980	7185	6900
150	28	16600	14940	-	15770	14195	-
150x300	28	16600	14940	14193	15770	14195	13630
200	28	28500	25650	-	27075	24370	-
200x400	28	28500	25650	24367	27075	24370	23395
250	28	46000	41400	-	43700	39330	-
250x500	28	46000	41400	39330	43700	39330	37760
300	28	66300	59670	-	62985	56685	-
300x600	28	66300	59670	56686	62985	56685	54420

SIZING

Sizing of gas pressure regulator involves establishing if the regulator C_g is higher than the required C_g and if the outlet velocity of gas at regulator outlet flange is within the required limits.

The following units shall be used in the below formulas:

- Q = Flow Rate [Sm^3/h] (Reference conditions $T=15^\circ\text{C}$, $P=1$ barg)
- P_u = Upstream Pressure [bar g]
- P_d = Downstream (Controlled) Pressure [bar g]
- P_b = Atmospheric Pressure [bar]
- d = Gas Density Relative to Air
- t_u = Upstream Temperature [$^\circ\text{C}$]
- DN = Regulator Outlet Nominal Diameter [mm]
- v = Gas Velocity at Outlet Flange [m/s]

According to the ratio of inlet to outlet pressure there are two cases using different formulas.

a) Sub Critical Flow Conditions

$$(P_u - P_d) \leq 0.5 \times (P_u + P_b)$$

Required C_g is calculated with the following formula.

$$C_g = \frac{Q}{13.57} \sqrt{\frac{d(t_u + 273)}{(P_d + P_b)(P_u - P_d)}}$$

b) Critical Flow Conditions

$$(P_u - P_d) > 0.5 \times (P_u + P_b)$$

Required C_g is calculated with the following formula.

$$C_g = \frac{2Q}{13.57 (P_u + P_b)} \sqrt{d(t_u + 273)}$$

CG TA-935

Class	DN50	DN80	DN100	DN150	DN200	DN250	DN300
Cg	2300	4700	8400	16600	28500	46000	66300

In case of gases different from $d=0.61$ Natural Gas a correction factor F shall be used in the value of the Flow Rate Q used in the above formulas.

The Flow Rate to be used shall be $Q'=Q/F$.

F is taken from the following table.

Gas conversion table

Gas	Relative Density [d]	Coefficient [F]
Air	1	0.78
City Gas	0.44	1.17
Butane	2.01	0.55
Propane	1.53	0.63
Nitrogen	0.97	0.79
Carbon Dioxide	1.52	0.63
Hydrogen	0.07	3.00

Velocity of gas at regulator outlet flange shall be calculated using the following formula:

$$v = \frac{345.92 \times Q \times (1 - 0.002 \times Pd)}{(DN^2 \times (Pd + Pb))}$$

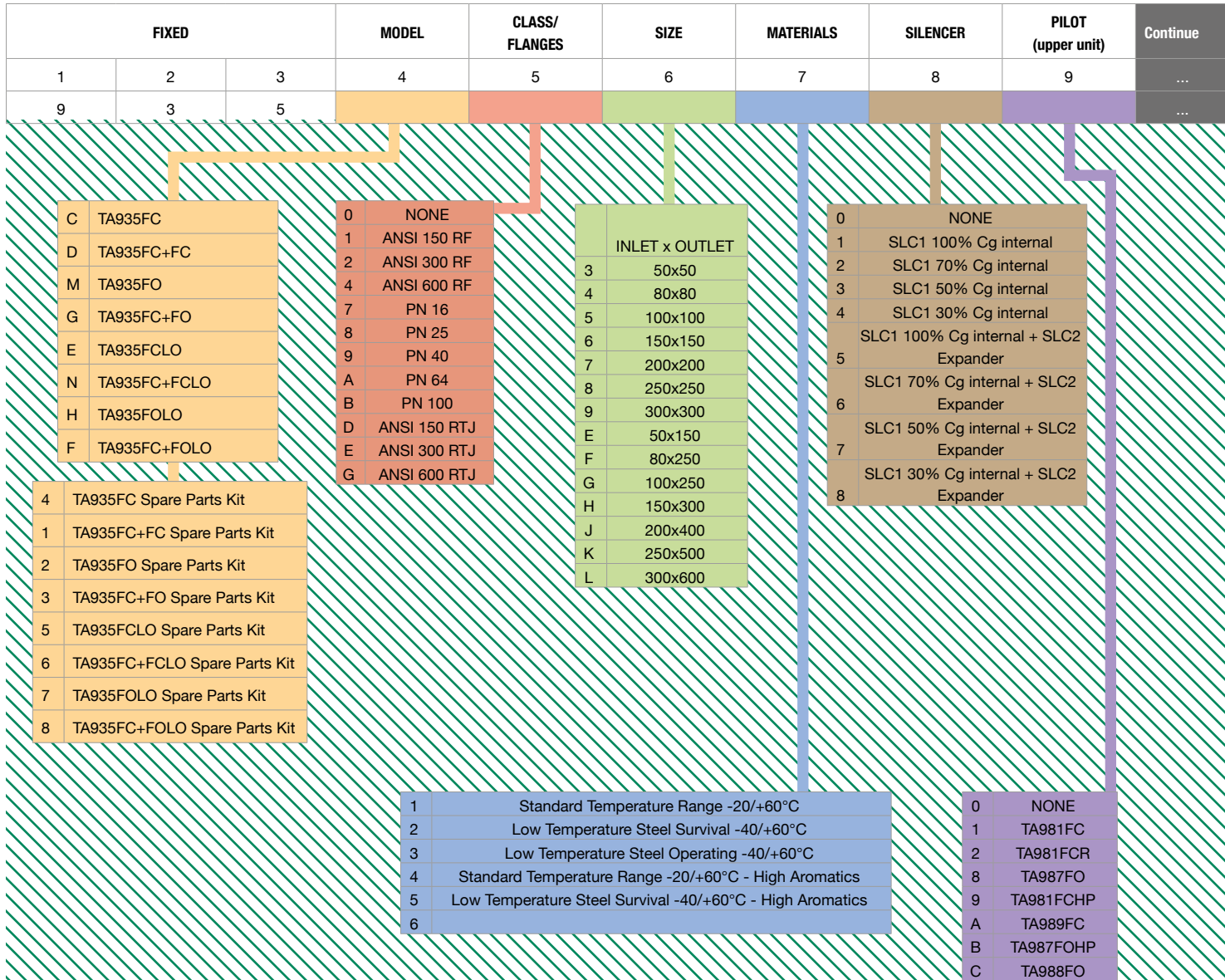
Allowable velocity

Downstream Pressure Pd [bar g]	Maximum Allowable Velocity v [m/s]
1	250
3	230
5	200
10 and higher	150

Interpolation may be used for intermediate values.

TA-935 PART NUMBERING FOR

Progressive Part Numbering



ASSEMBLED UNITS

Continue	PILOT (lower unit)	SSV HEAD	QEV	ACCESSORY REGULATOR	ACCESSORY PILOTS	ACCESSORY SSV	FLOW ORIENTATION		
...	10	11	12	13	14	15	16	17	18
...		0				0		0	0

0	NONE
1	TA981FC
2	TA981FCR
9	TA981FCHP
A	TA989FC

0	NONE
1	TA981QEV
2	TA982QEV

0	NONE
1	PNEUMATIC REMOTE S.P.
2	ELECTRIC REMOTE S.P.
3	FLOW LIMITATION

000	NO SPECIAL REQUESTS
001	SPECIAL REQUESTS
002	SPECIAL REQUESTS

0	NONE
1	OPEN/CLOSE MICROSWITCH
2	POSITION TRANSMITTER MAGDRIVE

0	NONE
R	LEFT TO RIGHT (STANDARD)
L	RIGHT TO LEFT

EMEA - ASEA



Tormene Industriale srl
Padua - Italy • +39 049 9004107
info@tormeneindustriale.com



Euromag International srl
Padua - Italy • +39 049 9005064
euromag@euromag.com



Light Engineering + Design srl
Padua - Italy • +39 049 0980809
info@lightengineering.net

NA - LATAM



Tormene Americana SA
Buenos Aires - Argentina • +54 4897.5999
tormene@tormeneamericana.com.ar



Tormene Americana do Brasil
Rio de Janeiro - Brazil • +55 21 2510.6155
consulta@tormenebrasil.com.br



Tormene Americana Colombia
Bogotá - Colombia • +571 45709464
gerencia@tormene.com.co



Tormene Andina SAC
Lima - Peru • +511 628.1595/596
tandina@tormeneandina.com.pe



Euromag Andina
Lima - Peru • +5116371844
euromag@euromag.com

PRC



TA Valves & Regulators Company
Sichuan - China • +86 813 5536 058
sales@tavrc.com

www.tormenegroup.com



Eximp Measurement Private Limited

Corporate Office Greater Kailash, New Delhi
Sales Office Nigdi, Pune
Projects Office Vadodara, Gujarat

Contact +91 020 27654694
E-Mail empl@eximpmeasurement.com

www.eximpmeasurement.com

