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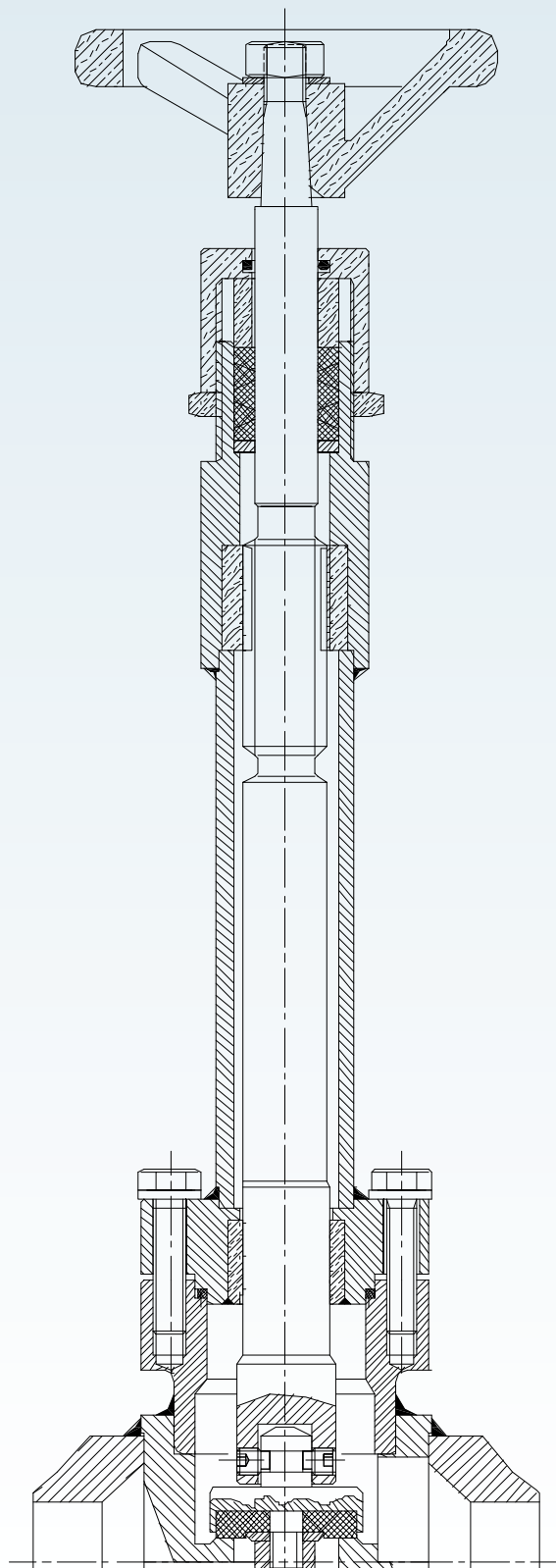
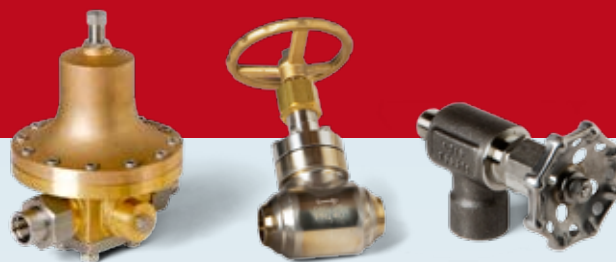
**Economizer pressure
Reducing valves**

Cryogenic valves

Gauge valves



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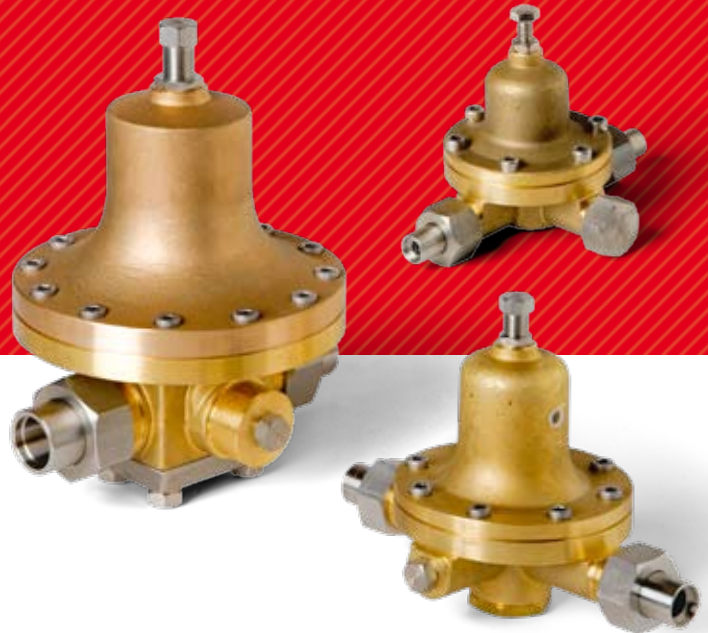


■ In 1954 **Leopoldo Boscarol** set up the Milanese company that still today bears his name, immediately making his mark in the sector for the quality of the first products that came off the production line: pressure gauge valves for high-pressures. In the early seventies following an intense design phase Boscarol started the manufacture of **cryogenic valves** for cold systems, once again meeting with great success and recognition. Today, Boscarol is a modern and dynamic company able to rationally plan its work and proud to have maintained the sense of an artisanal approach, in other words, respecting its tradition of processing and production precision. At the same time Boscarol has modernised by embracing new technologies and professionalism. The family-run company by now having reached the third generation is still in constant growth, always keeping a watchful eye on the quality of its products. In recent years the company has won yet another challenge with the manufacture of even more sophisticated instruments, namely **reducers and economizers**, thereby carving out a position of sector leader for itself. The production and organisational flexibility of the company allows it to satisfy, thanks to the experience gained over the last fifty years, a standard demand as a more modest requirement, meeting the delivery times agreed upon and offering its clientele an extended service for accessories and any overhauls. The production area today covers 1.000 square metres.

Numerically controlled lathes and state-of-the-art equipment contribute to achieving a superior level of operating precision. Since 2000 Boscarol has been operating according to quality parameters whose terms, rules and guidelines are now the custom language daily spoken in the company. All this translates into full control over purchasing, methodical planning of production, containing costs and decidedly competitive prices. Boscarol operates in compliance with EN ISO 9001:2000 standards for the Quality System and is monitored by RT-WUV. Its products are in conformity with the European Directives 94/9/ATEX and 97/23/EC related to pressurised devices.

ECONOMIZERS AND REDUCERS

■ One of the most frequent malfunctions that occur in a system is the development of overpressure. The economizer solves the problems generated by this phenomenon. A system without an economizer, if the liquids/gases contained in the tank exceed the preset pressure, even only slightly, would eliminate the excess pressure. The economizer restores the normal pressure values, recovers excess and returns the loss in the normal operating cycle, thus providing safety and economy of the entire system. Unlike safety valves, it does not release the excess pressure into the atmosphere but, after a cooling process conveys it back to its natural seat. Similar in appearance to the economizer, the function of the reducer is to reduce the upstream pressure by adjusting it to a lower value downstream, holding it constant as the upstream flow rate and pressure changes. The operating time of the diaphragm is fourteen times higher than that of the shutter. This ratio allows obtaining an extremely sensitive, precise and constant overflow opening and respecting the pressure value set downstream. Bodies available in three passage diameters: 6.5, 15 and 25 mm with straight or angled couplings, threaded or welded. For the diameters 15 and 25 mm, all the external components are available in stainless steel.



ECONOMIZERS – REDUCERS				
Nominal diameter (ND)		6,5	15	25
Nominal pressure (NP)	40 bar / 580 psi			
Operating temperatures	-196°C/-321°F ÷ +50°C/+122°F			
Couplings	Threaded	5/8" BSP male	1" BSP male	1 1/4" BSP male
	Pocket welded	Ø 12,1 mm	Ø 17,2 Ø 23,2 mm	Ø 27,6 mm
Maximum adjustment range	1-25 bar	1-35 bar	1-20 bar	
Flow coefficient cv ¹⁾	0,58	1,8	4,8	
Reference standards	ASME/ANSI B16.34 - EN 12300, 738-2 ISO 5208			
Certification	Directive 94/9/CE (ATEX)			
Materials	Adjusting screw	Stainless steel 303		
	Housing	Brass CW617N	Brass CW617N or stainless steel 304/316	Bronze or stainless steel 304/316
	Adjustment spring	CrSi steel - 52SiCrNi5-coated		
	Membrane	Bronze EN1652 CW452K or stainless steel 304		
	Seal	PTFE		
	Flange	-	-	Brass CW617N or stainless steel
	Shutter	PTFE		
	Body	Brass CW617N	Brass CW617N or stainless steel 304/316	Brass CW617N or stainless steel 304/316
	Lower body cap	-	Brass or stainless steel 304/316	Stainless steel 304/316

1) USA gallons per minute of water at 60°F with a pressure difference of 1 psi

All the technical specifications may be subject to change without prior notice.

CRYOGENIC BYPASS

■ Having contained dimensions, they find application in tank instrument blocks. They are particularly suitable for differential pressure measurement applications and hence allow controlling the fluid contained in the system. Available in two versions: three or four valves, and the option of a 40 diameter flange for connection to the control pressure gauge. Straight or square couplings with distance between centres of 35 mm (three or four valves) or 35 mm (inlet), 54 mm (outlet) in the four-valve version. The tapered pin shutter is free to turn with respect to the stem, thus preventing wear from rubbing in the closing phase.

3-4 VALVE CRYOGENIC BYPASS	
Nominal pressure (NP)	40 bar / 580 psi
Operating temperature	-196°C/-321°F ÷ +50°C/+122°F
Couplings	Male/female threaded: 1/4 NPT, 1/4 BSP, UNF ¹⁾
Certification	Directive 94/9/CE (ATEX)
Materials	Body: Stainless steel. A479-grade 304 Stem: Stainless steel. A479-grade 316 Pin shutter: Stainless steel A479-grade 316 with stellite insert Seal: PTFE Handwheel: bleached brass

1) Other types of threading on request.

THREE-PIECE JOINTS

■ Support accessories for cryogenic applications they allow connecting various pipes to each other. They are composed of two spherical seal spigots and are interconnected by a threaded union. Effective seal is obtained from the convex-conical connection.

THREE-PIECE JOINTS		
Passage mm (inch)	8 (1/4") - 15 (1/2") - 20 (3/4") - 25 (1")	
Nominal pressure (NP)	40 bar / 580 psi	
Operating temperature	-196°C/-321°F ÷ +50°C/+122°F	
Reference standards	ASME/ANSI: B16.34, B16.11, B16.25	
Certification	Directive 97/23/CE (PED)	
Materials	Coupling:	Stainless steel 304
	Spigot:	Stainless steel 303

CRYOGENIC VALVES

■ Functional and easy to maintain, they meet the loading and drawing requirements for fluids at very low temperature (-196°C) constantly respecting the required safety margins. Available in different passage diameters - from 6 to 50 nominal diameter (1/4" to 2") - and up to a nominal pressure of 40 (Class 300), they are an essential accessory for oxygen, nitrogen and argon storage and distribution systems. Intended for use in delicate applications, for example with oxygen, each component of the valve is degreased and assembled in a clean environment. Bodies available: straight or angled, machined from stainless steel bars, resistant to low temperatures. Available in two sleeve versions: longer for cryogenic temperatures (cold line) or standard length for ambient temperature gas (hot line), and fastened to the valve body by means of threading or flange. For the BOSCAROL threaded coupling series the shutter with metal seal has a ground stellite insert in the tapered seal section and offers high resistance to corrosion and plasma because of its particular hardness, and the seat is machined in the body. In addition, because it is articulated, it self-centres in its seat without rotating. In the CRIO series with soft seal the shutter is in glass-reinforced PTFE and is articulated to prevent sliding in its seat.



CHECK VALVES

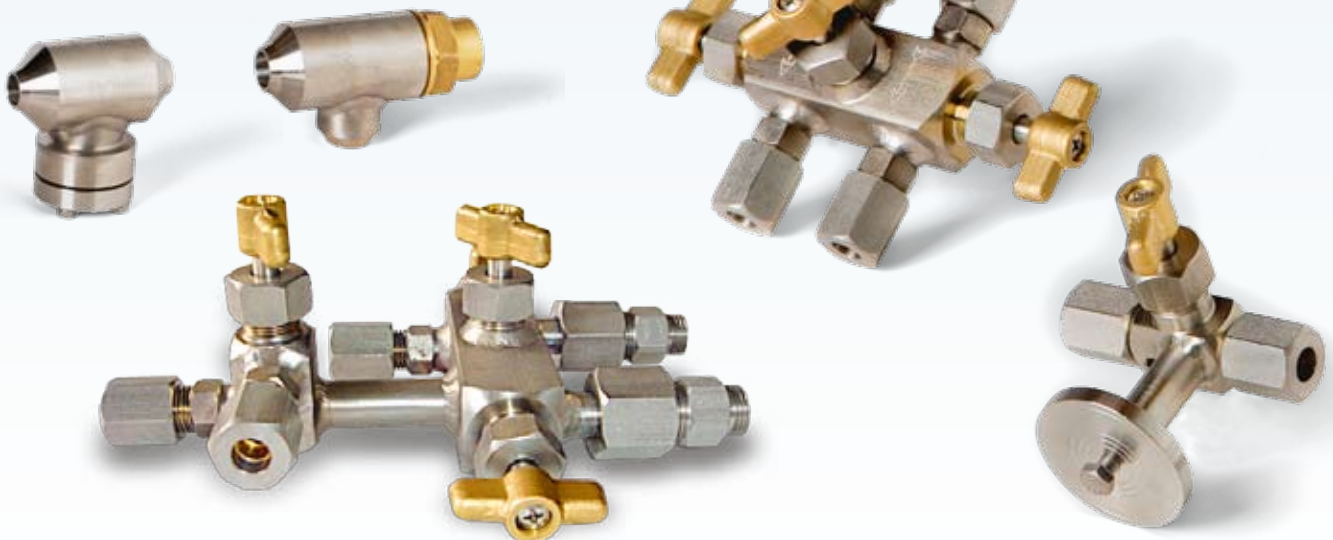
■ Also defined as non-return and one-way valves, they prevent backflow of pressurised fluid.

GLOBE-TYPE CRYOGENIC VALVES – CLASS 300

Nominal diameter (ND)	6-10-15-20-25-32-40-50 / 1/4"-2"
Nominal pressure (NP)	40 bar / 580 psi
Operating temperatures	-196°C/-321°F ÷ +50°C/+122°F
Couplings	Pocket/head welded, flanged, threaded (ANSI B.1.20.1 or BSP)
Reference standards	ASME/ANSI: B16.34, B16.11, B16.25, B16.25, B16.5, EN 1626, ISO 5208
Certification	Directive 97/23/CE (PED) Directive 94/9/CE (ATEX)
Materials	Body: Stainless steel A479-grade 304 Sleeve: Stainless steel A479-grade 304 Brass CW617N (threaded type) Sleeve piping: Stainless steel A479-grade 304 Rod: Stainless steel. A479-grade 304 Seal: PTFE Shutter seal: glass-reinforced PTFE

GLOBE-TYPE RETENTION VALVES - CLASS 300

Nominal diameter (ND)	10-15-20-25-32-40-50 / 3/8"-2"
Nominal pressure (NP)	40 bar / 580 psi
Operating temperatures	-196°C/-321°F ÷ +50°C/+122°F
Couplings	Pocket/head welded
Reference standards	ASME/ANSI: B16.34, B16.11, B16.25, B16.25, B16.5, EN 1626, ISO 5208
Certification	Directive 97/23/CE (PED) Directive 94/9/CE (ATEX)
Materials	Body: Stainless steel. A479-grade 304 Cap: Stainless steel. A479-grade 304 Brass CW617N (type threaded) Shutter seal: PTFE



PRESSURE GAUGE VALVES



Intended for operation in high-pressure conditions and where there are sudden thermal excursions, they are normally applied to piping, machines or systems where it is necessary to adjust or interrupt the flow of feed or waste fluids.

They have been designed and constructed as a support for pressure gauges, at the same time offering the possibility of fluid control.

With their easy grip they work just like a common tap. Connected to the pressure gauge, their pressure can be reset by acting on the bleeding screw. They can also be used as on-off valves and are made of high-quality materials, selected, treated and machined according to the specific operating conditions.

The bodies are available in the two- or three-way version and in different materials: brass, stainless steel 316, carbon steel (burnished or galvanised). There is a wide choice in threaded couplings; in the three-way version a 40 mm diameter flange can be fitted for connection to the control pressure gauge.

PRESSURE GAUGE VALVES				
Series		Brass 2/3 way	Carbon steel 2/3 way	Stainless steel 2/3 way
Passage		Ø 3 mm ¹⁾		
Operating limit	PTFE	125 bar - 100°C	250 bar - 100°C	400 bar - 100°C
	TBA	125 bar - 200°C	120 bar - 300°C	120 bar - 400°C
Couplings		Threaded male/female (NPT, BSP, BSPT, API) ²⁾		
Reference standards		DIN 16270 - 16271		
Certification		Directive 94/9/CE (ATEX)		
Materials	Body	Brass CW617N ³⁾	Carbon steel A105 ⁴⁾	Stainless steel AISI 316
	Stem	Stainless steel 410	Stainless steel 410	Stainless steel AISI 316
	Pin shutter	Hardened stainless steel 420	Hardened stainless steel 420	Stainless steel 316 with stellite insert
	Seal	PTFE or TBA		

1) Also 4.5 mm Ø

2) Other types of threading on request

3) Bleached on request

4) Galvanised or burnished

3-VALVE PRESSURE GAUGE BYPASS

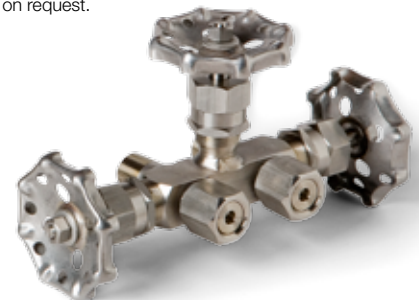
■ In systems requiring a bypass branch in a distribution circuit, the bypass intervenes to override an operation not required by the system. The bypass branch allows momentarily not reducing the system power, overriding drops in system efficiency, thus creating an alternative to the normal path.

During the course of progressive measurements, the fluid contained in the system needs to be controlled through differential type pressure gauges.

Connected to a differential pressure gauge, the bypass meets this type of requirement with high-quality technical prerogatives. The central valve puts the two side ways into direct communication. On request, versions with accessories in galvanised ASTM A105 steel.

3-VALVE PRESSURE GAUGE BYPASS		
Passage		Ø 3 mm
Operating limit	PTFE	200 bar - 100°C
	TBA	120 bar - 400°C
Couplings		Threaded male/female (NPT, BSP) ¹⁾
Certification		Directive 94/9/CE (ATEX)
Materials	Body and stem	Stainless steel 316
	Pin shutter	Stainless steel 316 - with stellite insert
	Seal	PTFE or TBA
	Handwheel	Stainless steel 304

1) Other types of threading on request.



2-VALVE MANIFOLD

They come in the shape of a double pressure gauge valve.

The main aim during the design phase was to contain the running costs when used on measuring systems and to obtain a saving by using double valves with different nipples and unions.

The threaded bleeding hole allows drainage through a pipe and hence fluid recovery. The body is machined from a bar and is available in stainless steel or galvanised carbon steel. On request, versions with galvanised ASTM A105 steel accessories.

2-VALVE MANIFOLD		
Passage		Ø 3 mm
Operating limit	PTFE	200 bar - 100°C
	TBA	120 bar - 350°C
Couplings		Threaded female inlet/outlet: 1/2 NPT Female threaded bleeding hole: 1/4
Certification		Directive 94/9/CE (ATEX)
Materials	Body and stem	Stainless steel 316
	Pin shutter	Stainless steel 316 - with stellite insert
	Seal	PTFE or TBA
	Handwheel	Stainless steel 304



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