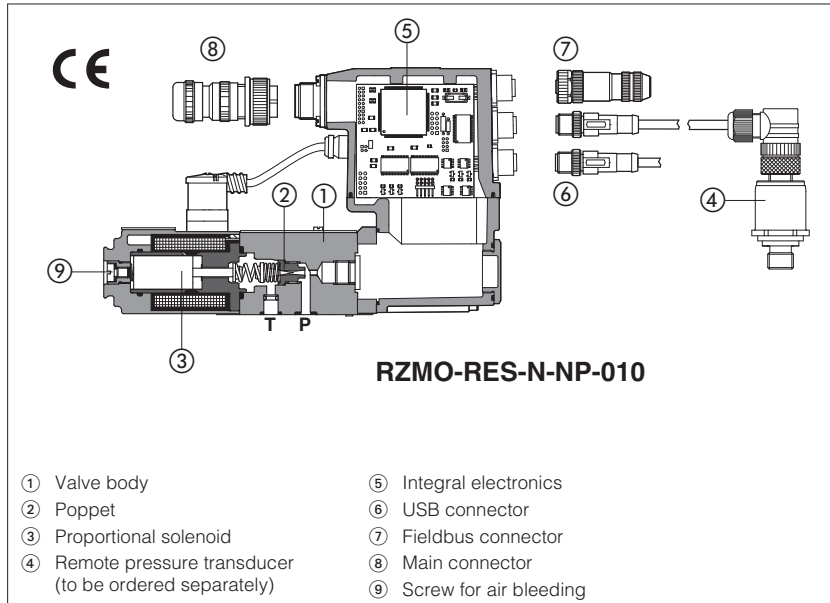


Proportional pressure valves with remote pressure transducer

digital, closed loop high performances, rugged design

Available only on request



Proportional pressure relief and reducing valves with closed loop integral digital driver and remote pressure transducer.

Executions:

- **REB-N** with basic integral digital electronic driver, analog reference signals and USB port for software functional parameters setting
- **RES-N** with full integral digital electronic driver and fieldbus interface for functional parameters setting, reference signals and real-time diagnostics

The integral digital electronic driver performs the valve's hydraulic regulation according to the reference signal and assures valve-to-valve interchangeability thanks to the factory presetting.

The remote pressure transducer type E-ATR-8 must be ordered separately, see section 10

Typical application: installations where the proportional valve is far from the point of the hydraulic circuit in which the pressure has to be monitored.

1 MODEL CODE OF PRESSURE RELIEF AND COMPENSATOR VALVES

RZMO	-	REB	-	N	-	NP	-	*	/	*	/	*	/	*
RZMO = size 06 (ISO 4401) AGMZO = size 10, 20, 32 (ISO 6264) LIMZO = size 16÷80 (ISO 7368) LICZO = size 16÷50 (ISO 7368)												Series number		Seals material, see sect. 7, 8: - = NBR PE = FKM BT = HNBR
REB = basic integral driver RES = full integral driver														Dynamic response preset see section 9: - = omit for PID 1 fast (default) 2 = PID 2 standard 3 = PID 3 smooth
N = remote pressure transducer														
Fieldbus interfaces - USB port always present (1): NP = Not present BP = PROFIBUS DP BC = CANopen EH = EtherCAT														
Valve size configuration, max regulated pressure, see tech. table of relevant REB/RES-P valves, as indicated in sect. 18														

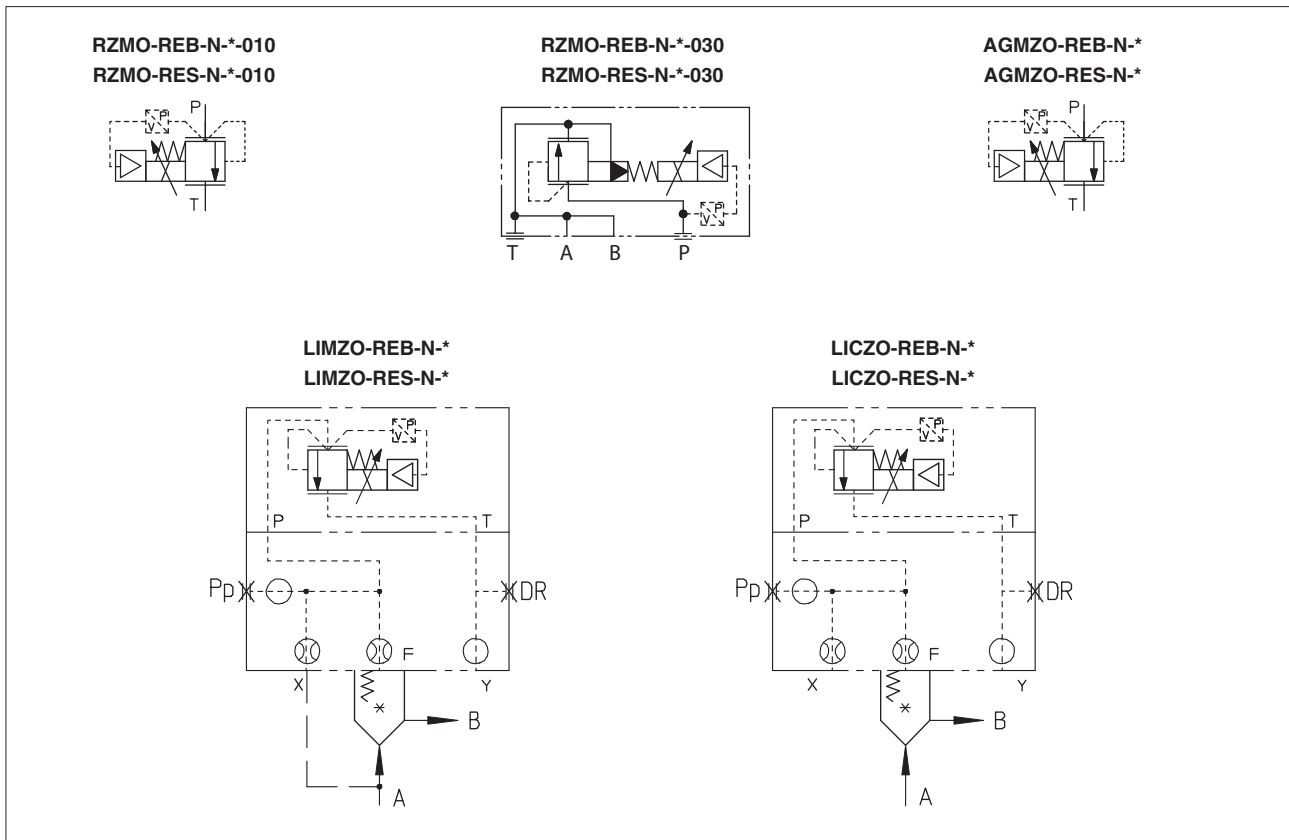
(1) **REB** available only in version **NP**; **RES** available only in version **BC, BP, EH**

2 MODEL CODE OF PRESSURE REDUCING VALVES

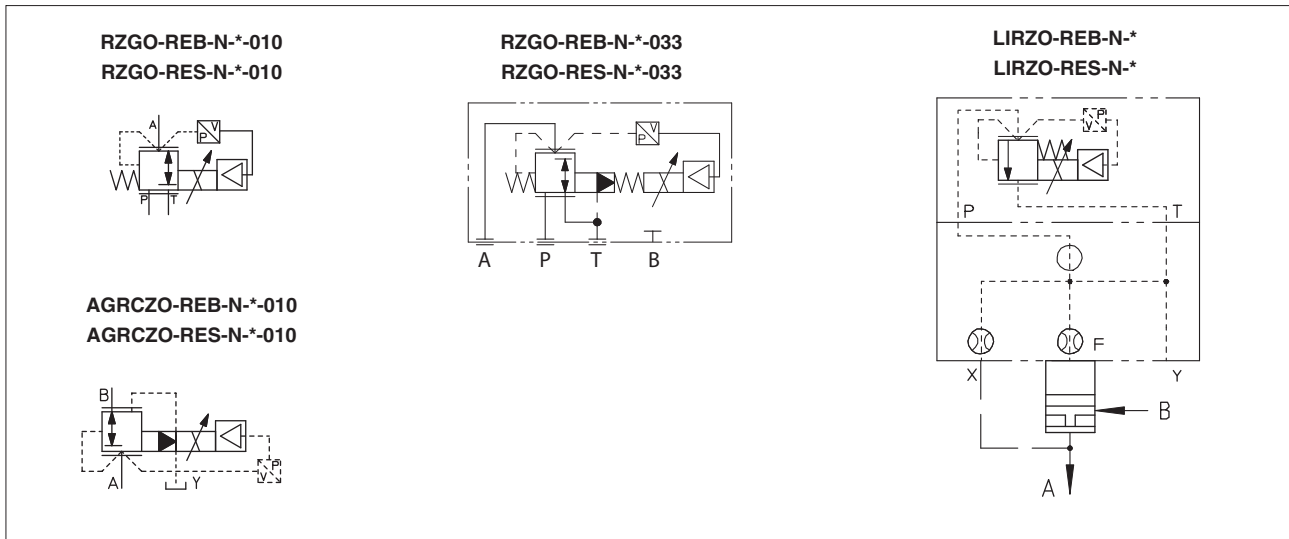
RZGO	-	REB	-	N	-	NP	-	*	/	*	/	*	/	*
RZGO = size 06 (ISO 4401) AGRCZO = size 10, 20 (ISO 6264) LIRZO = size 16÷40 (ISO 7368)												Series number		Seals material, see sect. 7, 8: - = NBR PE = FKM BT = HNBR
REB = basic integral driver RES = full integral driver														Dynamic response preset see section 9: - = omit for PID 1 fast (default) 2 = PID 2 standard 3 = PID 3 smooth
N = remote pressure transducer														
Fieldbus interfaces - USB port always present (1): NP = Not present BP = PROFIBUS DP BC = CANopen EH = EtherCAT														
Valve size configuration, max regulated pressure, see tech. table of relevant REB/RES-P valves, as indicated in sect. 18														

(1) **REB** available only in version **NP**; **RES** available only in version **BC, BP, EH**

3 HYDRAULIC SYMBOLS PRESSURE RELIEF AND COMPENSATOR VALVE



4 HYDRAULIC SYMBOLS PRESSURE REDUCING VALVE



5 GENERAL NOTES

Proportional valves are CE marked according to the applicable Directives (e.g. Immunity/Emission EMC Directive and Low Voltage Directive). Installation, wirings and start-up procedures must be performed according to the general prescriptions shown in table F003 and in the installation notes supplied with relevant components.

The electrical signals of the valve (e.g. monitor signals) must not be directly used to activate safety functions or components, as prescribed by the European standards (Safety requirements of fluid technology systems and components-hydraulics, EN-982).

6 FIELDBUS - only for RES

Fieldbus allows the direct communication of the proportional valve with machine control unit for digital reference signal, diagnostics and settings of functional parameters. Analog reference signal remain available on the main connector for quick commissioning and maintenance. For detailed information about fieldbus features and specification see tech table **GS510**.

7 MAIN CHARACTERISTICS - based on mineral oil ISO VG 46 at 50 °C

Assembly position	Any position			
Subplate surface finishing	Roughness index, Ra 0,4 flatness ratio 0,01/100 (ISO 1101)			
MTTFd valves according to EN ISO 13849	See technical table P007			
Ambient temperature range	REB, RES: standard = -20°C ÷ +60°C,		/BT option = -40°C ÷ +60°C	
Storage temperature range	REB, RES: standard = -20°C ÷ +70°C,		/BT option = -40°C ÷ +70°C	
Coil resistance R at 20°C	3 ÷ 3,3 Ω			
Max. solenoid current	2,6 A			
Max. power	REB, RES = 50 Watt			
Remote pressure transducer	Power supply: +24VDC @ max 100 mA Pressure input: voltage, maximum range ±10 VDC Input impedance, Ri > 50 Ω current, maximum range ±20 mA Input impedance, Ri = 500 Ω			
Insulation class	H (180°) Due to the occuring surface temperatures of the solenoid coils, the European standards ISO 13732-1 and EN982 must be taken into account			
Protection degree to DIN EN60529	IP66/67 with mating connectors			
Tropicalization	Tropical coating on electronics PCB			
Duty factor	Continuous rating (ED=100%)			
EMC, climate and mechanical load	See technical table G004			
Communication interface	USB Atos ASCII coding	CANopen EN50325-4 + DS408	PROFIBUS DP EN50170-2/IEC61158	EtherCAT IEC 61158
Communication physical layer	not insulated USB 2.0 + USB OTG	optical insulated CAN ISO11898	optical insulated RS485	Fast Ethernet, insulated 100 Base TX

(1) Average response time value; the pressure variation in consequence of a modification of the reference input signal to the valve is affected by the stiffness of the hydraulic circuit: greater is the stiffness of the circuit, faster is the dynamic response, see section [9](#).

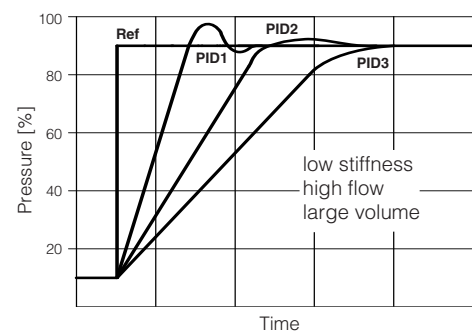
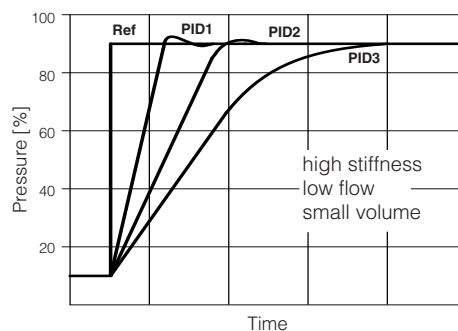
8 SEALS AND HYDRAULIC FLUID - for other fluids not included in below table, consult our technical office

Seals, recommended fluid temperature	NBR seals (standard) = -20°C ÷ +60°C, with HFC hydraulic fluids = -20°C ÷ +50°C FKM seals (/PE option) = -20°C ÷ +80°C HNBR seals (/BT option) = -40°C ÷ +60°C, with HFC hydraulic fluids = -40°C ÷ +50°C		
Recommended viscosity	20 ÷ 100 mm ² /s - max allowed range 15 ÷ 380 mm ² /s		
Fluid contamination class	ISO 4406 class 20/18/15 NAS 1638 class 9, achievable with in line filter - 10 μm (β10 ≥75 recommended)		
Hydraulic fluid	Suitable seals type	Classification	Ref. Standard
Mineral oils	NBR, FKM, HNBR	HL, HLP, HLPD, HVLP, HVLPD	DIN 51524
Flame resistant without water	FKM	HFDU, HFDR	ISO 12922
Flame resistant with water	NBR, HNBR	HFC	

9 DYNAMIC RESPONSE - 4 pressure PIDs

The valve is provided with 4 PID configurations to match different hydraulic conditions. The required PID configuration can be selected before the valve commissioning, through Atos E-SW software via USB port. Only for **RES** the PID can be also selected in real time, through PLC via fieldbus.

PID	Dynamic response example diagrams at side
1	Fast - default
2	Standard
3	Smooth
4	Open Loop



Above indications have to be considered as a general guideline, being affected by hydraulic circuit stiffness, working flow and dead volume. The valve's dynamics can be further optimized on the specific application, customizing PIDs parameters.

10 REMOTE PRESSURE TRANSDUCER

10.1 Pressure transducer failure - only for /C option

In case of pressure transducer failure, only for 4 ÷ 20 mA pressure transducer feedback, the valve's reaction can be configured through Atos E-SW software to:

- cut off the current to solenoid, therefore the regulated pressure will be reduced to minimum value (default setting)
- automatically switch the pressure control from closed loop (PID1,2,3) to open loop (PID4), to let the valve to temporarily operate with reduced regulation accuracy

10.2 Remote pressure transducer factory preset

The valve is factory preset to operate with pressure transducer type E-ATR-8 having a standard measuring range specifically sized to match the valve max regulated pressure. Please refer to below table to select the correct E-ATR-8 measuring range:

Valve model	Valve max regulated pressure	E-ATR-8 standard pressure measuring range (table GS465)
RZGO	32 = 32 bar	60 = 0 ÷ 60 bar
RZGO, RZMO	100 = 100 bar	160 = 0 ÷ 160 bar
AGMZO, AGRCZO	210 = 210 bar	250 = 0 ÷ 250 bar
LIMZO, LIRZO, LICZO	315 = 315 bar 350 = 350 bar	400 = 0 ÷ 400 bar

In case the selected pressure transducer has a measuring range different to the above standard, the valve pressure feedback scale must be set according to the new measuring range, using E-SW software.

Please consider that a different pressure measuring range respect to the standard may cause following situations:

- selected range higher than standard = the valve regulation accuracy will be reduced in consequence of the lower pressure feedback resolution
- selected range lower than standard = the transducer could be damaged if the system pressure will exceed transducer max measuring range

11 ELECTRONIC OPTIONS

Standard driver execution provides on the 7 pin main connector:

Power supply - 24 VDC must be appropriately stabilized or rectified and filtered; a 2,5 A fuse time lag is required in series to each driver power supply. Apply at least a 10000 µF/40 V capacitance to single phase rectifiers or a 4700 µF/40 V capacitance to three phase rectifiers

Reference input signal - analog differential input with 0÷+10 V_{DC} nominal range (pin D,E), proportional to desired valve pressure regulation

Monitor output signal - analog output signal proportional to the actual valve pressure regulation = 0÷+10 V_{DC} nominal range

Note: a minimum booting time of 500 ms has been considered from the driver energizing with the 24 VDC power supply before the valve has been ready to operate. During this time the current to the valve coils is switched to zero.

11.1 Option /I

It provides 4 ÷ 20 mA current reference and monitor signals, instead of the standard 0÷+10 V_{DC}.

Input signal can be reconfigured via software selecting between voltage and current, within a maximum range of ±10 V or ±20 mA.

It is normally used in case of long distance between the machine control unit and the valve or where the reference signal can be affected by electrical noise; the valve functioning is disabled in case of reference signal cable breakage

11.2 Option /Q

To enable the driver, supply 24 VDC on pin C referred to pin B: Enable input signal allows to enable/disable the current supply to the solenoid, without removing the electrical power supply to the driver; it is used to maintain active the communication and the other driver functions when the valve has to be disabled. This condition does not comply with European Norms EN13849-1 (ex EN954-1).

11.3 Option /Z

It provides, on the 12 pin main connector, the following additional features:

Enable Input Signal

To enable the driver, supply 24 VDC on pin 3 referred to pin 2: Enable input signal allows to enable/disable the current supply to the solenoid, without removing the electrical power supply to the driver; it is used to maintain active the communication and the other driver functions when the valve has to be disabled. This condition does not comply with European Norms EN13849-1 (ex EN954-1).

Fault Output Signal

Fault output signal indicates fault conditions of the driver (solenoid short circuits/not connected, reference signal cable broken for 4÷20mA input, etc.). Fault presence corresponds to 0 VDC, normal working corresponds to 24 VDC (pin 11 referred to pin 2): Fault status is not affected by the Enable input signal

Power supply for driver's logics and communication

Separate power supply (pin 9,10) allow to cut solenoid power supply (pin 1,2) while maintaining active diagnostics, USB and fieldbus communication.

A safety fuse is required in series to each driver power supply: 500 mA fast fuse.

11.4 Options /C

Option /C is available to connect pressure transducers with 4 ÷ 20 mA current output signal, instead of the standard ±10 V.

Input signal can be reconfigured via software selecting between voltage and current, within a maximum range of ±10 V or ±20 mA.

11.5 Possible combined options: /CI, /IQ, /IZ, /CIQ, /CIZ

12 ELECTRONIC CONNECTIONS

12.1 Main connector signals - 7 pin - standard and /Q options (A1)

PIN	Standard	/Q	TECHNICAL SPECIFICATIONS	NOTES
A	V+		Power supply 24 Vdc	Input - power supply
B	V0		Power supply 0 Vdc	Gnd - power supply
C	AGND		Analog ground	Gnd - analog signal
		ENABLE	Enable (24 Vdc) or disable (0 Vdc) the driver, referred to V0	Input - on/off signal
D	P_INPUT+		Pressure reference input signal: ± 10 Vdc / ± 20 mA maximum range	Input - analog signal Software selectable
E	INPUT-		Negative reference input signal for P_INPUT+	Input - analog signal
F	P_MONITOR referred to: AGND V0		Pressure monitor output signal: $0 \div 10$ Vdc / $0 \div 20$ mA maximum range	Output - analog signal Software selectable
G	EARTH		Internally connected to driver housing	

12.2 Main connector signals - 12 pin - /Z option (A2)

PIN	/Z	TECHNICAL SPECIFICATIONS	NOTES
1	V+	Power supply 24 Vdc	Input - power supply
2	V0	Power supply 0 Vdc	Gnd - power supply
3	ENABLE	Enable (24 Vdc) or disable (0 Vdc) the driver, referred to V0	Input - on/off signal
4	P_INPUT+	Pressure reference input signal: ± 10 Vdc / ± 20 mA maximum range	Input - analog signal Software selectable
5	INPUT-	Negative reference input signal for P_INPUT+	Input - analog signal
6	P_MONITOR	Pressure monitor output signal: $0 \div 10$ Vdc / $0 \div 20$ mA maximum range, referred to V0	Output - analog signal Software selectable
7	NC	Do not connect	
8	NC	Do not connect	
9	VL+	Power supply 24 Vdc for driver's logic and communication	Input - power supply
10	V0	Power supply 0 Vdc for driver's logic and communication	Gnd - power supply
11	FAULT	Fault (0 Vdc) or normal working (24 Vdc), referred to V0	Output - on/off signal
PE	EARTH	Internally connected to driver housing	

12.3 Communication connectors (B) - (C)

(B) USB connector - M12 - 5 pin always present		
PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	+5V_USB	Power supply
2	ID	Identification
3	GND_USB	Signal zero data line
4	D-	Data line -
5	D+	Data line +

(C1) BC fieldbus execution, connector - M12 - 5 pin (2)		
PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	CAN_SHLD	Shield
2	NC	do not connect
3	CAN_GND	Signal zero data line
4	CAN_H	Bus line (high)
5	CAN_L	Bus line (low)

(C2) BP fieldbus execution, connector - M12 - 5 pin (2)		
PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	+5V	Termination supply signal
2	LINE-A	Bus line (high)
3	DGND	Data line and termination signal zero
4	LINE-B	Bus line (low)
5	SHIELD	

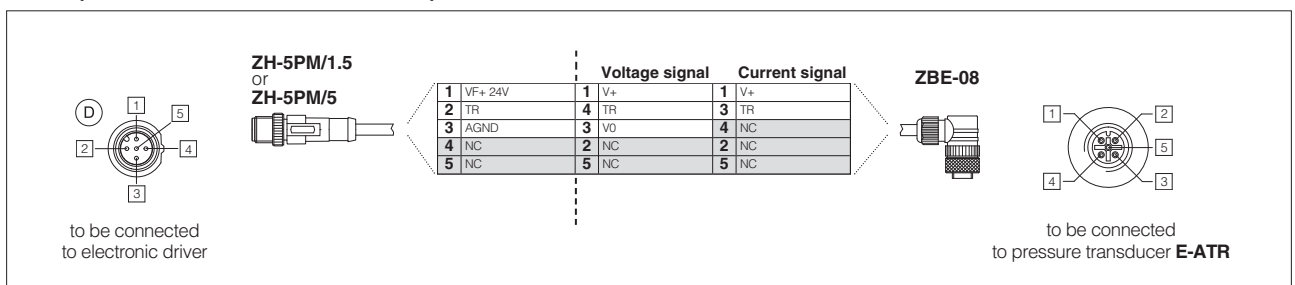
(C3) (C4) EH fieldbus execution, connector - M12 - 4 pin (2)		
PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	TX+	Transmitter
2	RX+	Receiver
3	TX-	Transmitter
4	RX-	Receiver
Housing	SHIELD	

Notes: (1) shield connection on connector's housing is recommended (2) only for RES execution

12.4 Remote pressure transducer connector - M12 - 5 pin (D)

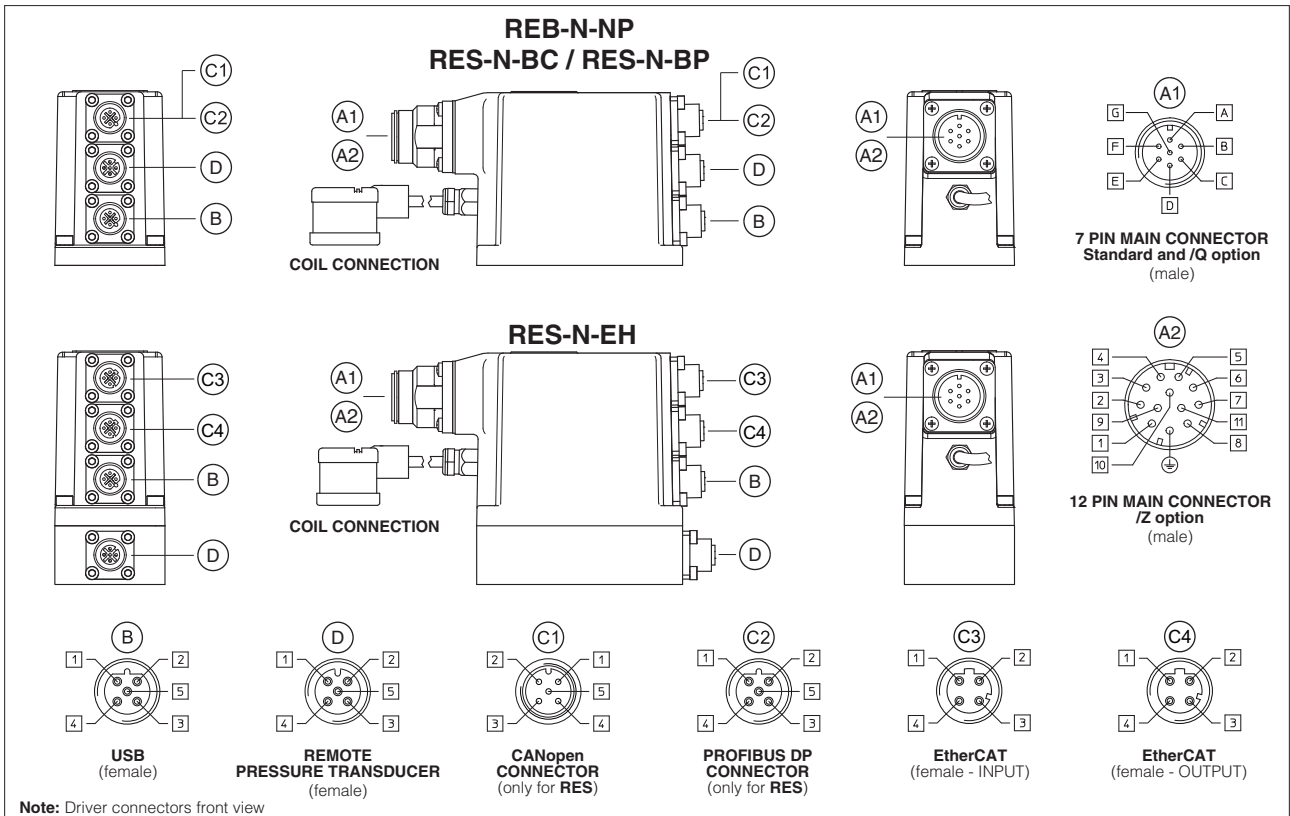
PIN	SIGNAL	TECHNICAL SPECIFICATION	NOTES	Voltage	Current
1	VF +24V	Power supply +24Vdc	Output - power supply	Connect	Connect
2	TR	Signal transducer ± 10 Vdc / ± 20 mA maximum range	Input - analog signal Software selectable	Connect	Connect
3	AGND	Common gnd for transducer power and signals	Common gnd	Connect	/
4	NC	Not Connect		/	/
5	NC	Not Connect		/	/

Remote pressure transducer connection - example

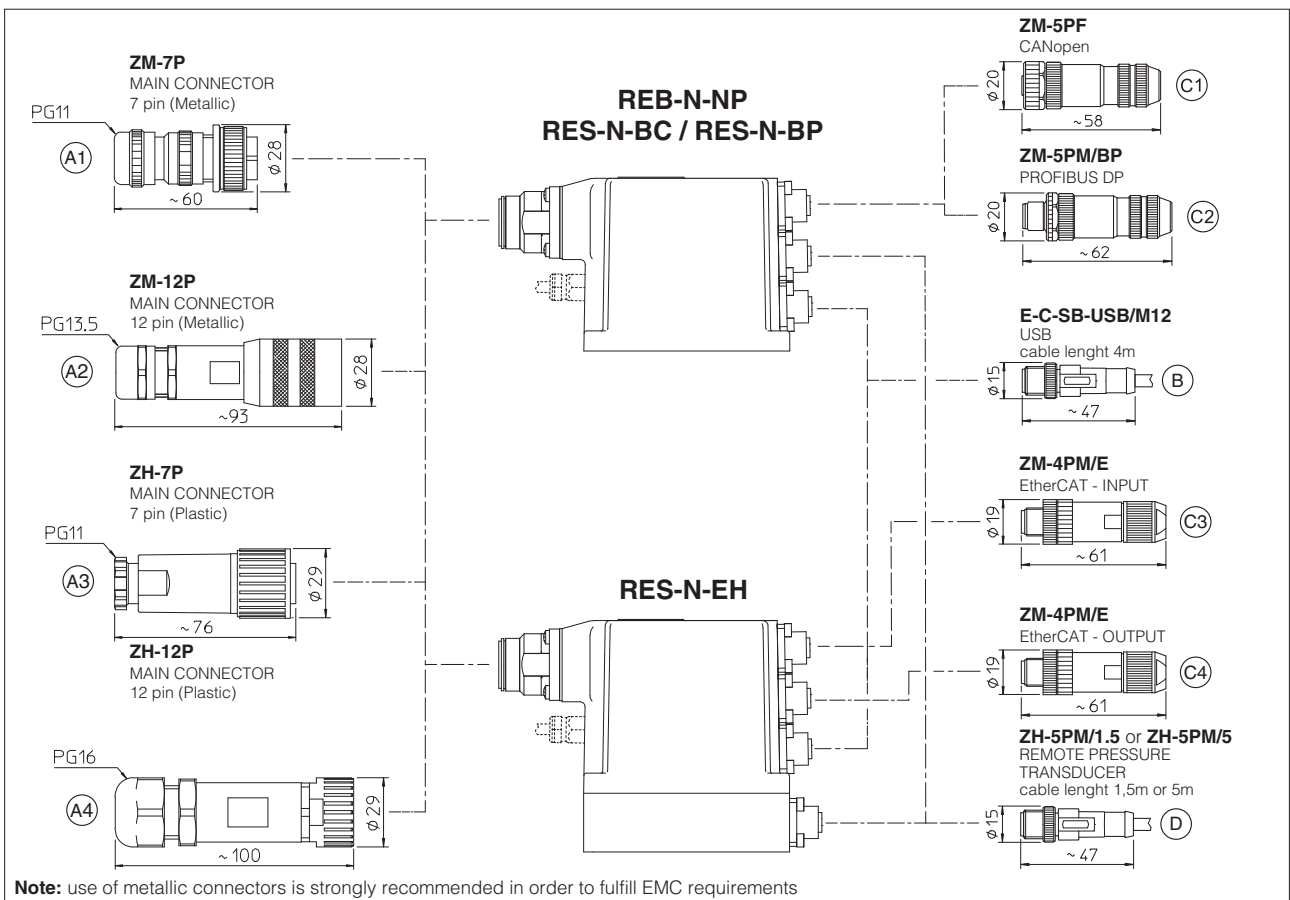


Note: connectors front view

13 CONNECTIONS



14 CONNECTORS



15 MODEL CODES OF MAIN CONNECTORS AND COMMUNICATION CONNECTORS - to be ordered separately

VALVE VERSION	REB, RES	REB/Z, RES/Z	Remote Transducer		BC - CANopen	BP - PROFIBUS DP	EH - EtherCAT
CONNECTOR CODE	ZM-7P (A1)	ZM-12P (A2)	ZH-5PM/1.5 (D)	ZH-5PM/5 (D)	ZM-5PF (C1)	ZM-5PM/BP (C2)	ZM-4PM/E (C3)
	ZH-7P (A3)	ZH-12P (A4)					ZM-4PM/E (C4)
PROTECTION DEGREE	IP67						
DATA SHEET	TGS205, K500						

16 PROGRAMMING TOOLS - see tech table **GS500**

Valve's functional parameters and configurations, can be easily set and optimized using Atos E-SW programming software connected via USB port to the digital driver. For fieldbus versions, the software permits valve's parameterization through USB port also if the driver is connected to the central machine unit via fieldbus.

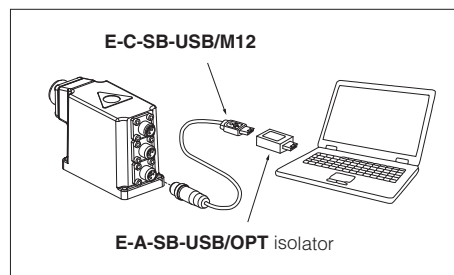
The software is available in different versions according to the driver's options:

E-SW-BASIC support: NP (USB) PS (Serial) IR (Infrared)
E-SW-FIELDBUS support: BC (CANopen) BP (PROFIBUS DP) EH (EtherCAT)
 EW (POWERLINK) EI (EtherNet/IP)
E-SW-*/PQ support: valves with SP, SF, SL alternated control (e.g. E-SW-BASIC/PQ)

WARNING: drivers USB port is not isolated!

The use of isolator adapter is highly recommended for PC protection (see table **GS500**)

USB connection



17 ELECTRONIC DRIVERS

Valve model	REB	RES
Drivers model	E-RI-REB-N	E-RI-RES-N
Type	Digital	
Format	Integral to valve	
Data sheet	TGS205	

Note: for main and communication connectors see sections **14**, **15**

18 INSTALLATION DIMENSIONS

Pressure relief

RZMO-RE*-N-010 see technical table FS010
RZMO-RE*-N-030 see technical table FS067
AGMZO see technical table FS040
LIMZO see technical table FS305

Pressure compensator

LICZO see technical table FS305

Pressure reducing

RZGO-RE*-N-010 see technical table FS020
RZGO-RE*-N-033 see technical table FS075
AGRCZO see technical table FS055
LIRZO see technical table FS305