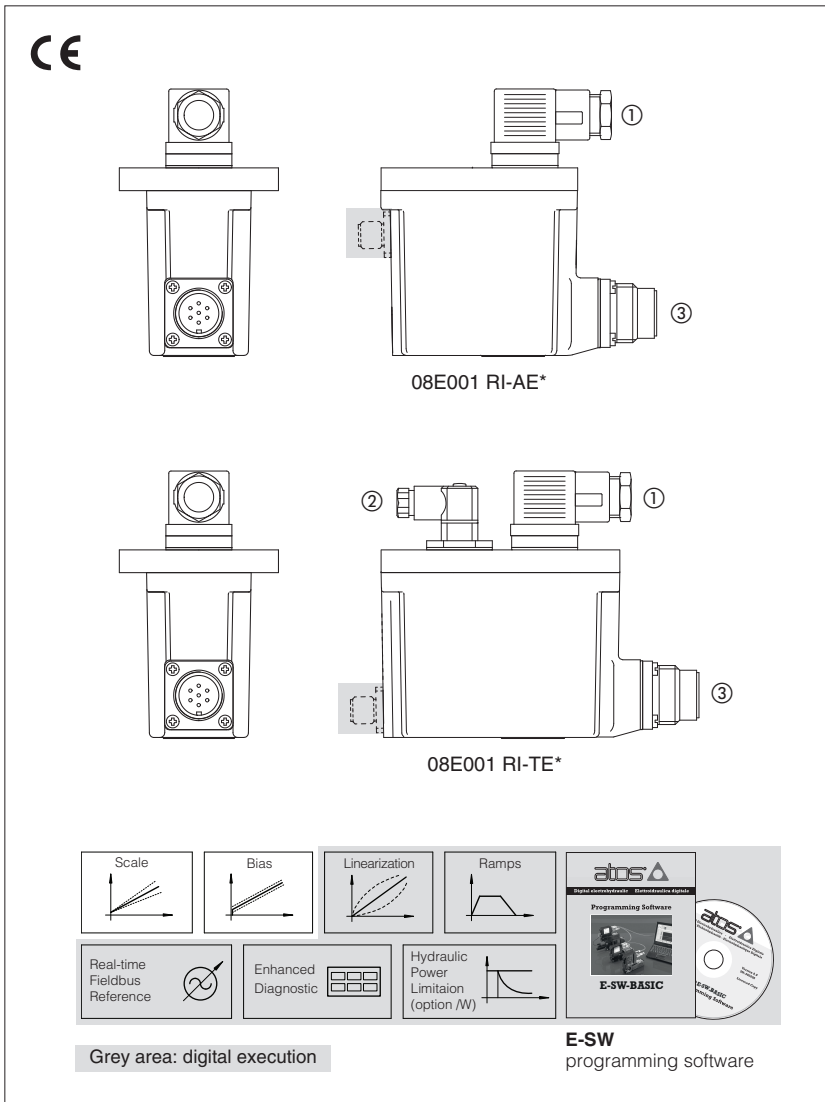


Analog or Digital 08E001 RI-* drivers

box format, for proportional valves with or without transducer(s)



08E001 RI-*

Open loop drivers supply and control the current to the solenoid, of Atos proportional valves without transducer, according to the electronic reference input signal.

Closed loop drivers control the position of the spool or poppet of direct and pilot operated proportional valves according to the electronic reference input signal.

AE or AES can drive single or double solenoid proportional valve without position transducer.

TE or TES operates direct and pilot operated directional/flow control valves with one spool position transducer.

LE or LES operates directional pilot operated valves with two spool position transducers.

Solenoid(s) ① and spool feedback ② connectors are placed on upper plate.

For digital execution Atos PC software allows to customize the driver configuration to the specific application requirements.

Electrical Features:

- Functional factory preset parameters for best performances
- 7 pin main connector ③ for power supply, analog input reference and monitor signals
- 5 pin serial communication port (only digital driver)
- 5 pin CANopen or PROFIBUS DP communication connector (only digital executions)
- 4 pin EtherCAT communication connectors (only for AES)
- /Z option 12 pin main connector for additional enable, fault or logic state signals
- IP67 protection degree
- CE mark according to EMC directive

Software Features (only digital execution):

- Intuitive graphic interface
- Setting of valve's functional parameters: bias, scale, ramps, dither
- Linearization function for the hydraulic regulation
- Setting of valve's dynamic response to optimize the application performances
- /I option for selection of analog IN/OUT range (software selectable for AES)
- /W option software selectable max power limitation function (only for AES)
- Complete diagnostics of driver status

1 MODEL CODE

08E001 RI	-	AE	S	-	PS	-	01H /	*	/	*
Special code for electronic driver										
AE = for proportional valves without position transducer TE = for proportional valves with one position transducer LE = for proportional valves with two position transducers - = analog S = digital										
Communication interfaces (only for digital electronic) PS = Serial BC = CANopen BP = PROFIBUS DP EH = EtherCAT - only for AES										
Options - Analog executions - see section 3: F = fault signal - only for TE, LE I = current reference input and monitor Q = enable signal Z = enable, fault and monitor signal (12 pin connector) - only for TE, LE Options - Digital executions - see section 4: I = current reference input and monitor (software selectable for AES) Z = double power supply, enable, fault and monitor signals (12 pin connector) W = power limitation function - only for AES										
01H = for single solenoid proportional valves 05H = for double solenoid proportional valves - only for AE(S), TE(S)										
(1) set code identifies the correspondance between the digital driver and the relevant valve; it is assigned by Atos when the driver is ordered as a spare part										

2 DRIVERS RANGE

Drivers model	AE	AES	TE, LE	TES, LES s31	TES/S*, LES/S* s31
Data sheet	G110	G115	G200	G210obs	G212obs

3 ANALOG EXECUTIONS - CONNECTIONS, SETTING AND LED

AE

(remove the rear cover)

AE
SW: dither frequency selector
RD: ramp for decreasing reference signal
RU: ramp for increasing reference signal
B2: negative bias adjust - only for 3 position valves
B1: positive bias adjust
S2: negative scale adjust - only for 3 position valves
S1: positive scale adjust

SW selector				Dither frequency [Hz]
SW1	SW2	SW3	SW4	
OFF	OFF	OFF	OFF	100
ON	OFF	OFF	OFF	130
OFF	ON	OFF	OFF	160
OFF	OFF	ON	OFF	200 (1)
ON	OFF	ON	OFF	230
OFF	ON	ON	OFF	270
ON	ON	ON	OFF	300
ON	ON	OFF	ON	380
ON	OFF	ON	ON	430
OFF	ON	ON	ON	470
ON	ON	ON	ON	500

(1) Dither frequency is factory preset at 200 Hz and its regulation may be adjusted after contact Atos technical office

TE - LE

(remove the rear cover)

TE - LE
B2: negative bias adjust - only for 3 position valves
B1: positive bias adjust
S2: negative scale adjust - only for 3 position valves
S1: positive scale adjust
LED: OFF normal working; ON fault present

Note: connectors front view

3.1 Main connector - 7 pin - for AE version (A1) - see 6.1

Standard 7pin	SIGNAL	TECHNICAL SPECIFICATIONS	NOTES
A	V+	Power supply 24 Vdc for solenoid power stage and driver logic	Input - power supply
B	V0	Power supply 0 Vdc for solenoid power stage and driver logic	Gnd - power supply
C (1)	AGND	Ground - signal zero for MONITOR signal	Gnd - analog signal
	ENABLE	Enable (24 Vdc) or disable (0 Vdc) the driver (for /Q option)	Input - on/off signal
D	INPUT+	Reference analog differential input: ± 10 Vdc maximum range (4 \div 20 mA for /I option) For single solenoid valves the reference input is 0 \div 10 Vdc (4 \div 20 mA for /I option)	Input - analog signal
E	INPUT -	For double solenoid valves the reference input is ± 10 Vdc (4 \div 20 mA for /I option)	
F	MONITOR	Monitor analog output: ± 5 Vdc maximum range (1V monitor = 1A coil current) For single solenoid valves: 0 \div 5 Vdc referred to pin C (for /I option) 0 \div 5 Vdc referred to pin B (for /Q option) For double solenoid valves: ± 5 Vdc referred to pin C (for /I option) ± 5 Vdc referred to pin B (for /Q option)	Output - analog signal
G	EARTH	Internally connected to the driver housing	

Note: (1) with /Q option ENABLE signal replaces AGND on pin C; MONITOR signal is referred to pin B

3.2 Main connectors - 7 and 12 pin - for TE and LE versions (A1) (A2) - see 6.1 and 6.2

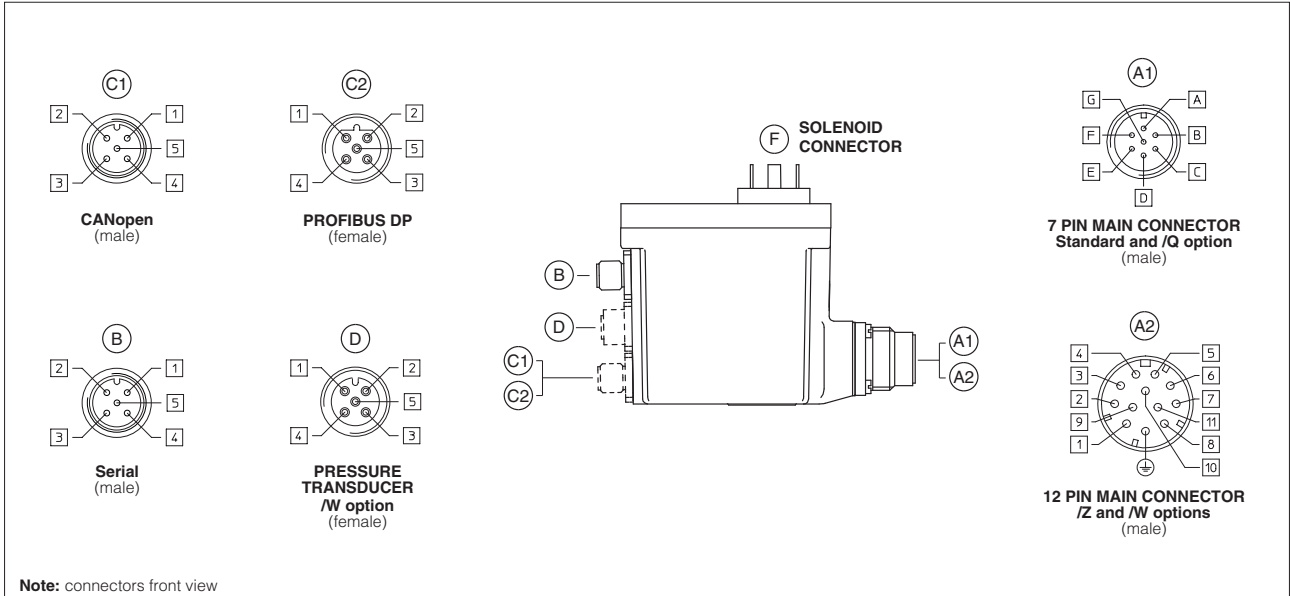
Standard 7pin	/Z option 12pin	SIGNAL	TECHNICAL SPECIFICATIONS	NOTES
A	1	V+	Power supply 24 Vdc for solenoid power stage and driver logic	Input - power supply
B	2	V0	Power supply 0 Vdc for solenoid power stage and driver logic	Gnd - power supply
C (1)	7	AGND	Ground - signal zero for MONITOR signal (for standard, /Z options)	Gnd - analog signal
	3	ENABLE	Enable (24 Vdc) or disable (0 Vdc) the driver (for /Q, /Z options)	Input - on/off signal
D	4	INPUT+	Reference analog differential input: ± 10 Vdc maximum range (4 \div 20 mA for /I option)	Input - analog signal
E	5	INPUT -	For two position valves the reference input is 0 \div +10 Vdc (4 \div 20 mA for /I option) For three position valves the reference input is ± 10 Vdc (4 \div 20 mA for /I option)	
F (2)	6	MONITOR	Monitor analog output: ± 10 Vdc maximum range (4 \div 20 mA for /I option)	Output - analog signal
	11	FAULT	Fault (0V) or normal working (24V) (for /F, /Z options)	Output - on/off signal
-	8	R_ENABLE	Repeat Enable - output repetition of Enable input	Output - on/off signal
-	9	NC	do not connect	Output - on/off signal
-	10	NC	do not connect	Output - on/off signal
G	PE	EARTH	Internally connected to the driver housing	

Notes: (1) with /Q option ENABLE signal replaces AGND on pin C; MONITOR signal is referred to pin B

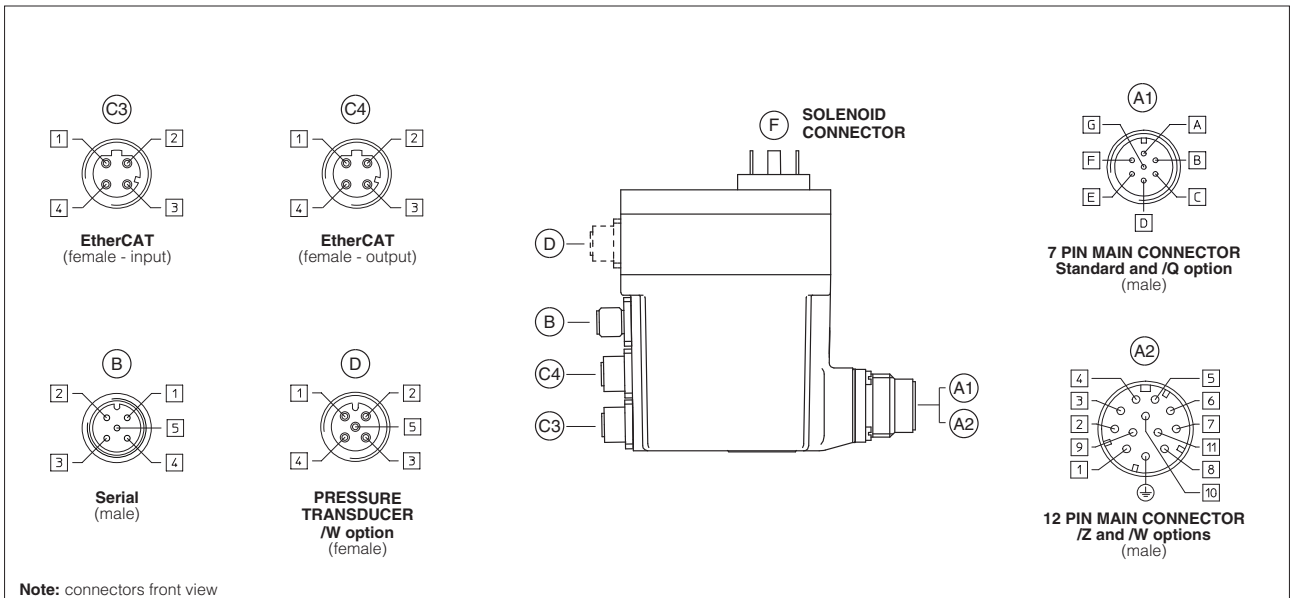
(2) with /F option FAULT signal replaces MONITOR on pin F

4 DIGITAL EXECUTIONS - CONNECTIONS

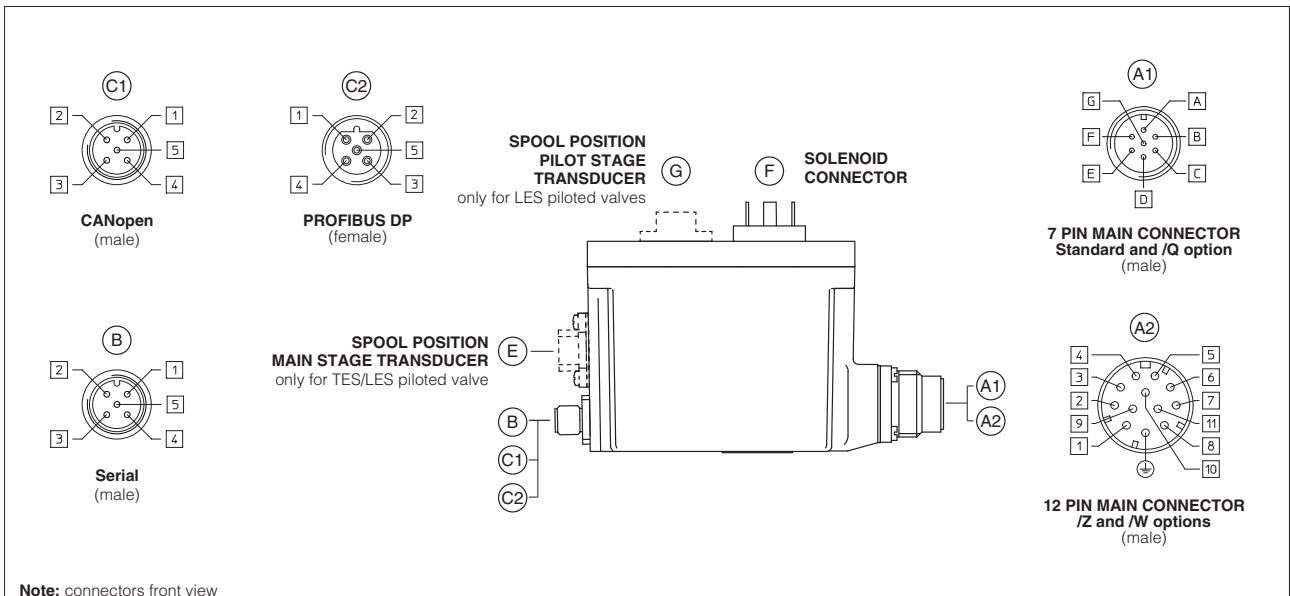
4.1 AES - Serial PS, CANopen BC and PROFIBUS DP BP executions



4.2 AES - EtherCAT EH executions



4.3 TES, LES - Serial PS, CANopen BC and PROFIBUS DP BP executions



4.4 Main connectors - 7 and 12 pin - for AES version (A1) (A2) - see 6.1 and 6.2

Standard 7pin	/Z and /W option 12pin	SIGNAL	TECHNICAL SPECIFICATIONS	NOTES
A	1	V+	Power supply 24 Vdc	Input - power supply
B	2	V0	Power supply 0 Vdc	Gnd - power supply
C (1)	5	AGND	Ground - signal zero for MONITOR signal (applying 24 Vdc to AGND electronics will be damaged) Ground - signal zero for INPUT+ signal (for /Z option)	Gnd - analog signal
	3	ENABLE	Enable (24 Vdc) or disable (0 Vdc) the driver (for /Q and /Z options)	Input - on/off signal
D	4	INPUT+	Reference analog input: ±10 Vdc / ±20 mA maximum range software selectable For single solenoid valves the reference input is 0 ÷ 10 Vdc (default setting)	Input - analog signal
E	-	INPUT -	For double solenoid valves the reference input is ±10 Vdc (default setting) Standard: differential input; /Z option: common mode INPUT+ referred to AGND	
F	6	MONITOR	Monitor analog output: ±5 Vdc maximum range. Referred to AGND for standard, /Z and /W options; referred to V0 for /Q option	Output - analog signal
-	7	NC	do not connect	
-	8	NC	do not connect	
		MONITOR2	2nd monitor analog output: ±5 Vdc maximum range, referred to AGND (for /W option)	Output - analog signal
-	9	VL+	Power supply 24 Vdc for driver logic	Input - power supply
-	10	VLO	Power supply 0 Vdc for driver logic	Gnd - power supply
-	11	FAULT	Fault (0 Vdc) or normal working (24 Vdc), referred to V0	Output - on/off signal
G	PE	EARTH	Internally connected to the driver housing	

Notes: (1) with /Q option ENABLE signal replaces AGND on pin C; MONITOR signal is referred to pin B

4.5 Main connectors - 7 and 12 pin - for TES and LES version (A1) (A2) - see 6.1 and 6.2

Standard 7pin	/Z option 12pin	SIGNAL	TECHNICAL SPECIFICATIONS	NOTES
A	1	V+	Power supply 24 Vdc	Input - power supply
B	2	V0	Power supply 0 Vdc	Gnd - power supply
-	3	ENABLE	Enable (24 Vdc) or disable (0 Vdc) the driver	Input - on/off signal
D	4	INPUT+	Reference analog input: ±10 Vdc maximum range (4 ÷ 20 mA for /I option) For single solenoid valves the reference input is 0 ÷ +10 Vdc (4 ÷ 20 mA for /I option)	Input - analog signal
E	-	INPUT -	For double solenoid valves the reference input is ±10 Vdc (4 ÷ 20 mA for /I option) standard: differential input; /Z option: common mode INPUT+ referred to AGND	
C	5	AGND	Ground - signal zero for MONITOR signal (applying 24 Vdc to AGND electronics will be damaged) Ground - signal zero for INPUT+ signal (for /Z option)	Gnd - analog signal
F	6	MONITOR	Monitor analog output: ±10 Vdc maximum range (4 ÷ 20 mA for /I option)	Output - analog signal
-	7	NC	do not connect	
-	8	NC	do not connect	
-	9	VL+	Power supply 24 Vdc for driver logic	Input - power supply
-	10	VLO	Power supply 0 Vdc for driver logic	Gnd - power supply
-	11	FAULT	Fault (0 Vdc) or normal working (24 Vdc), referred to V0	Output - on/off signal
G	PE	EARTH	Internally connected to the driver housing	

4.6 Communication connectors - see 6.3

(B) Serial connector - M12 - 5 pin		
PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	NC	do not connect
2	NC	do not connect
3	RS_GND	Signal zero data line
4	RS_RX	Valves receiving data line
5	RS_TX	Valves transmitting data line

(C1) CANopen connector - M12 - 5 pin		
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) PROFIBUS DP connector - M12 - 5 pin		
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) EtherCAT connector - M12 - 4 pin - only for AES-EH		
PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	TX+	Transmitter
2	RX+	Receiver
3	TX	Transmitter
4	RX-	Receiver
Housing	SHIELD	

Note: (1) shield connection on connector's housing is recommended

4.7 Pressure transducer connector - M12 - 5 pin - only for AES with /W option (D) - see 6.4

PIN	SIGNAL	Voltage Input - software selectable	Current Input - software selectable
1	VT	Power supply 24 Vdc	Power supply 24 Vdc
2	TR	Signal transducer 0 ÷ 10 Vdc maximum range (1)	Signal transducer 0 ÷ 20 mA maximum range (1)
3	AGND	Signal zero for power supply and signal	Do not connect
4	NC	Do not connect	Do not connect
5	NC	Do not connect	Do not connect

Note: (1) transducer feedback can be read as a digital information through fieldbus communication - software selectable

5 SOLENOID AND SPOOL FEEDBACK CONNECTORS - included

5.1 Solenoids connector (F)

PIN	SIGNAL	01H execution	05H execution - only for AE(S) and TE(S)	Type: 666 - see tech table K500
1	S1	Solenoid S1	Solenoid S1	
2	S1	Solenoid S1	Solenoid S1	
3	S2	do not connect	Solenoid S2	
Earth	S2	do not connect	Solenoid S2	

5.2 Spool feedback connector

PIN	SIGNAL	Pilot stage - only for LE(S) (G)	Main stage - only for TE(S) and LE(S) (E)	Type: 345 - see tech table K500
1	TR	Output signal	Output signal	
2	VT-	Reference -15Vdc	Reference -15Vdc	
3	VT+	Reference +15Vdc	Reference +15Vdc	
4	AGND	Common GND	Common GND	

6 CONNECTORS CHARACTERISTICS - to be ordered separately

6.1 Main connectors - 7 pin

CONNECTOR TYPE	POWER SUPPLY	POWER SUPPLY
CODE	(A1) ZM-7P	(A3) ZH-7P
Type	7pin female straight circular	7pin female straight circular
Standard	According to MIL-C-5015	According to MIL-C-5015
Material	Metallic	Plastic reinforced with fiber glass
Cable gland	PG11	PG11
Cable	LiYCY 7 x 0,75 mm ² max 20 m (logic and power supply) LiYCY 7 x 1 mm ² max 40 m (logic and power supply)	LiYCY 7 x 0,75 mm ² max 20 m (logic and power supply) LiYCY 7 x 1 mm ² max 40 m (logic and power supply)
Connection type	to solder	to solder
Protection (EN 60529)	IP 67	IP 67

6.2 Main connectors - 12 pin

CONNECTOR TYPE	POWER SUPPLY	POWER SUPPLY
CODE	(A2) ZM-12P	(A4) ZH-12P
Type	12pin female straight circular	12pin female straight circular
Standard	DIN 43651	DIN 43651
Material	Metallic	Plastic reinforced with fiber glass
Cable gland	PG13,5	PG16
Cable	LiYCY 12 x 0,75 mm ² max 20 m (logic and power supply)	LiYCY 10 x 0,14mm ² max 40 m (logic) LiYY 3 x 1mm ² max 40 m (power supply)
Connection type	to crimp	to crimp
Protection (EN 60529)	IP 67	IP 67

6.3 Serial and fieldbus communication connectors

CONNECTOR TYPE	PS SERIAL RS232
CODE	(B) ZM-5PF
Type	5pin female straight circular
Standard	M12 coding A – IEC 60947-5-2
Material	Metallic
Cable gland	Pressure nut - cable diameter 6÷8 mm
Cable	LiYCY 5 x 0,25 mm ² shielded
Connection type	screw terminal
Protection (EN 60529)	IP 67

CONNECTOR TYPE	BC CANopen (1)
CODE	(C1) ZM-5PF
Type	5pin female straight circular
Standard	M12 coding A – IEC 60947-5-2
Material	Metallic
Cable gland	Pressure nut - cable diameter 6÷8 mm
Cable	CANBus Standard (DR303-1)
Connection type	screw terminal
Protection (EN 60529)	IP 67

CONNECTOR TYPE	BP PROFIBUS DP (1)
CODE	(C2) ZM-5PM/BP
Type	5pin male straight circular
Standard	M12 coding B – IEC 60947-5-2
Material	Metallic
Cable gland	Pressure nut - cable diameter 6÷8 mm
Cable	PROFIBUS DP Standard
Connection type	screw terminal
Protection (EN 60529)	IP 67

CONNECTOR TYPE	EH EtherCAT (2)
CODE	(C3) (C4) ZM-4PM/E
Type	4pin male straight circular
Standard	M12 coding D – IEC 61076-2-101
Material	Metallic
Cable gland	Pressure nut - cable diameter 4÷8 mm
Cable	Ethernet Standard CAT-5
Connection type	terminal block
Protection (EN 60529)	IP 67

Notes: (1) E-TRM-** terminators can be ordered separately - see tech table GS500

(2) Internally terminated

6.4 Pressure transducer connector - only for AES with /W option

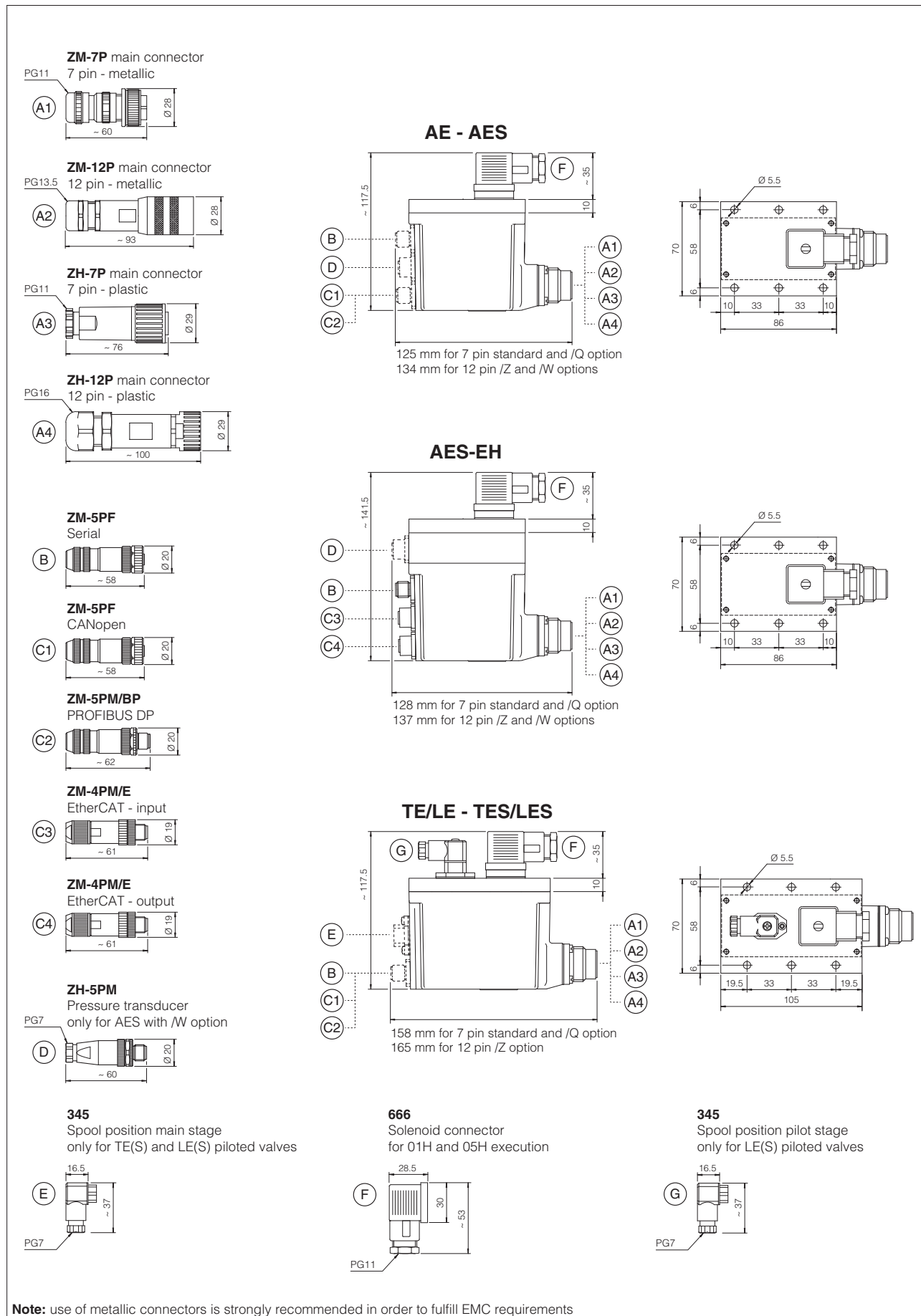
CONNECTOR TYPE	TRANSDUCER
CODE	(D) ZH-5PM
Type	5 pin male straight circular
Standard	M12 coding A – IEC 60947-5-2
Material	Plastic
Cable gland	PG7
Cable	diameter 4 - 6 mm
Connection type	screw terminal
Protection (EN 60529)	IP 67

7 MAIN CHARACTERISTICS

For drivers characteristics, please refer the related documentation available on catalog on-line at www.atos.com :

AE see table **G110**; **AES** see table **G115**; **TE, LE** see table **G200**; **TES, LES** s31 see table **G210obs**; **TES/S*, LES/S*** s31 see table **G212obs**

8 OVERALL DIMENSIONS [mm]



Note: use of metallic connectors is strongly recommended in order to fulfill EMC requirements