



**1/4 turn electric actuators
(irreversible reducer
with multi-turn electric actuator
ACTELEC 31:
screw-nut kinematics
ACTELEC 200 to 1600:
yoke kinematics**

Output torques up to 16000 Nm

Applications

- All sectors of Water, Energy and Industry markets.

General features

- The range of ACTELEC series electric actuators developed and manufactured by KSB-AMRI covers output torque values up to 16000 Nm.
- These actuators have been designed for all applications and for the operation of any type 1/4 turn valves (centred or double eccentric disc valves, ball valves,...).
- The mounting interface is in accordance with ISO 5211 standard.
- Equipped with an interchangeable insert, they can be easily fitted on different valve shaft (square end, flat end, key,...).
- The actuator is mounted directly or by means of an adaptor onto the valve mounting plate.

Protection

- They are hose and fine dust proof and are protected against accidental immersion: protection degree IP 67.
- Motor: insulation class F.

External coating

- Reducer: polyurethane paint, thickness 80 µm color dark grey RAL 7016,
- Electric actuator: polyurethane paint, thickness 80 µm, color grey RAL 9007.

Working temperature range

- From -20° C up to +70° C.

Construction

- This electric actuators range constituted with irreversible kinematics reducer associated with a multi-turn electric actuator is completed by a direct 1/4 turn actuators range with irreversible kinematic.
- Please consult the type series booklet ACTELEC 3 to 150 ref 8521.12-10.

Standard variant:

- ATEX version in accordance with 94/9/EC directive.

Production range

Type	Nominal output torque (Nm)	ISO 5211 mounting plate*	Maximal allowable dimensions for the shaft			
			Height	Driving by square	Driving by flat	key
31	1000	-----	40	36	36	Please, consult us
200	2000	F16	80	60	55	
400	4000	F16	80	60	55	
500	5000	F16 - F25	95	70	75	
800	8000	F16 - F25	95	70	75	
950	9500	F25 - F30	110	90	85	
1600	16000	F25 - F30	110	90	85	

* Direct adaptation onto identical mounting plate.

Adaptation by intermediate flange onto different plate (different size or shape).

Construction

Construction and basic equipments

In standard version, ACTELEC electric actuators are designed to ensure the on-off function, intermittent duty S2 15 mn. Remote electric control.

Basic equipments

- Electric motor protection by:
 - integrated thermic protection,
 - 2 travel limit microswitches (1 microswitch on opening position and 1 on closure position)
 - Torque limit system.
- Heating resistance anti-condensation.
- Manual emergency control by handwheel.
- Position indication.
- Mechanical adjustable travel stop(s).

Other constructions

- Motor for continuous duty - repetitive startings (S4 - 1200 startings/hour).
- Throttling duty with 4-20 mA integrated positioner.
- Integral electric control and remote control.
- Explosion-proof protection EExe.

Power supply

- Standard version:
 - 3-phase 230 V / 400 V - 50 Hz a.c.,
 - 1-phase 230 V - 50 Hz a. c.
- On request:
 - 24 or 48 V d. c.

Options on request (please, consult us)

- Additional microswitches adjustable on the whole travel for remote position signalisation (limit position and/or intermediate position).
- Microswitches coupled with torque limiter.
- Position transmission by potentiometer 1000 Ω or electronic transmitter 4-20 mA.
- Blinker.
- Communication interface - Intelligence - Fieldbus.
- Other power supplies.

ACTELEC 31 to 1600 actuators are based on a reducer with irreversible kinematics motorized by a multi-turn electric actuator with a mounting plate in accordance with ISO 5210 standard.
The mounting interface of these actuators onto the valve is in accordance with ISO 5211 standard.

Manufacturing range - Characteristics

Actuator Type	Basic reducer	Output torque Nm	Input torque Nm	Turn number of the operating screw	Electric actuator type	Actuator mounting plate
ACTELEC 31	M 31	900	60	32	SA 07-5	ISO 5210 size F10 shape B3
ACTELEC 200	MR 400	2000	60	47	SA 07-5	
ACTELEC 400	MR 400	4000	110	47	SA 10-1	
ACTELEC 500	MR 800	5000	60	135	SA 07-5	
ACTELEC 800	MR 800	8000	110	135	SA 10-1	
ACTELEC 950	MR 1600	9500	60	285	SA 07-5	
ACTELEC 1600	MR 1600	16000	110	285	SA 10-1	

Operating times

Actuator type	Actuator output speed (tr/mn)								
	11	16	22	32	45	63	90	120	180
ACTELEC 31	2mn 55s	2mn	1mn 28s	1mn	43s	30s			
ACTELEC 200 and 400	4mn 15s	3mn	2mn 10s	1mn 30s	1mn 2s	45s	31s		
ACTELEC 500 and 800		8mn 25s	6mn 5s	4mn 12s	3mn	2mn 8s	1mn 30s	1mn 5s	45s
ACTELEC 950 and 1600				8mn 45s	6mn 15s	4mn 30s	3mn 5s	2mn 20s	1mn 30s

Other operating times can be realised with a special reducer construction: please consult us.

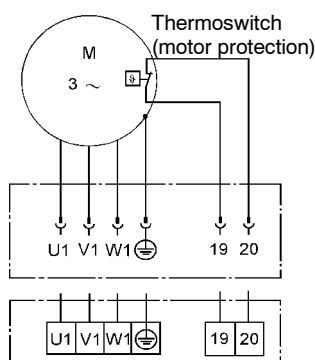
Characteristics actuator

Electric actuator type	Actuator output speed tr/mn	On-Off function 3-phase 400 V 50 Hz a.c.			
		Motor speed tr/mn	Nominal Power kW	Nominal intensity A	Starting intensity A
SA 07.5	11	1400	0,09	0,6	1,6
	16	2800	0,18	0,7	3,0
	22	2800	0,18	0,7	3,0
	32	1400	0,37	1,7	4,6
	45	1400	0,37	1,7	4,6
	63	2800	0,75	1,7	7,0
	90	2800	0,75	1,7	7,0
	125	2800	0,75	1,7	7,0
	180	2800	0,75	1,7	7,0
SA 10.1	11	1400	0,18	1,0	3,0
	16	2800	0,37	1,4	4,5
	22	2800	0,37	1,4	4,5
	32	1400	0,75	2,5	8,5
	45	1400	0,75	2,5	8,5
	63	2800	1,50	4,0	16,0
	90	2800	1,50	4,0	16,0
	125	2800	1,50	4,0	16,0
	180	2800	1,50	4,0	16,0

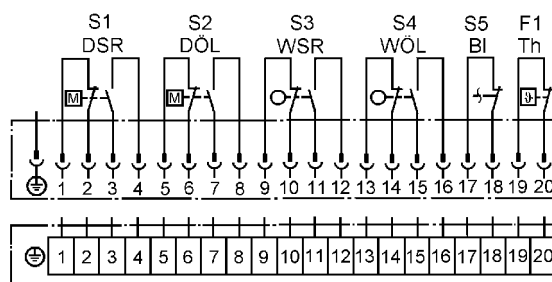
On-off function: wiring diagram no. KMS TP110/01

ACTELEC	31 SA 07-5	200 SA 07-5	400 SA 10-1	500 SA 07-5	800 SA 10-1	950 SA 07-5	1600 SA 10-1
Basic equipments							
Opening and closing travel limit switches	Standard						
Mechanical adjustable travel stops		Standard on closing position only					
Opening and closing torque limit switches	Standard						
Heating resistance	Standard						
Emergency control Number of handwheel turns	350	510	510	1480	1480	3130	3130
Other constructions							
Continuous duty	Yes						
Integral control	Yes - Refer to wiring diagram no. MSP 1110KC3---F17E1-KMSTP110/001						
Explosion-proof protection	Yes						
Power supply							
3-phase 230 V or 400 V a.c.	Yes						
1-phase 230 V a.c.	Yes						
24 V or 48 V d.c.	Option						

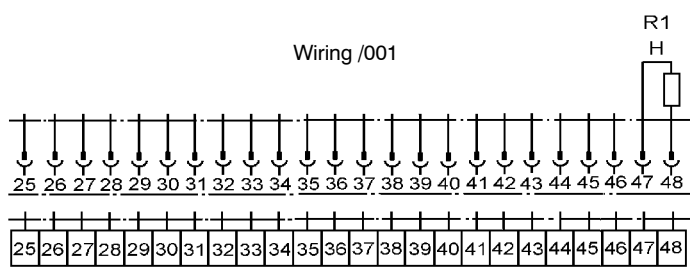
Motor wiring



Wiring TP 110



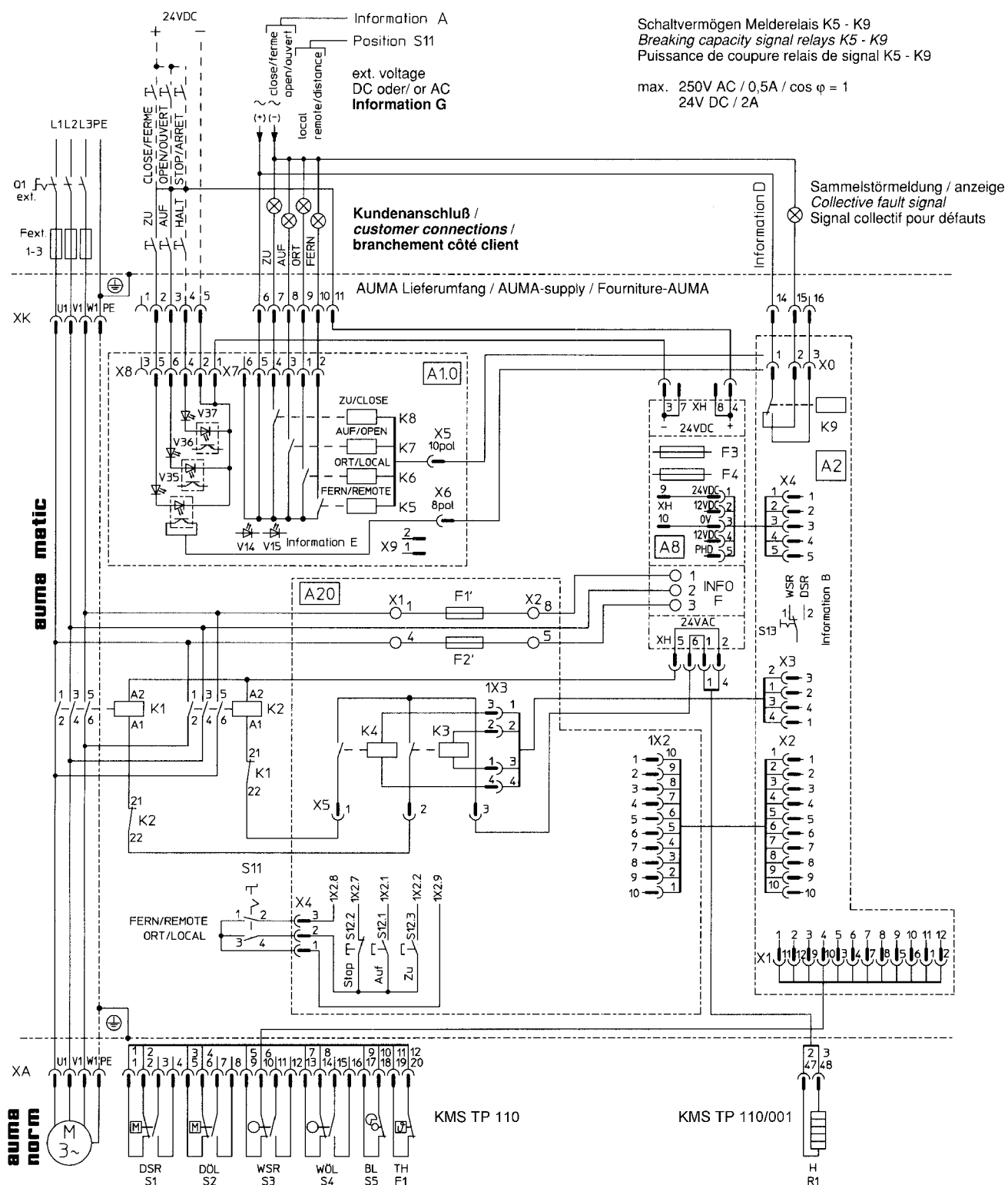
Wiring /001



- S1 DSR Torque limit switch, closing, clockwise rotation
- S2 DÖL Torque limit switch, opening, anti-clockwise rotation
- S3 WSR Travel limit switch, closing, clockwise rotation
- S4 WÖL Travel limit switch, opening, anti-clockwise rotation
- S5 BI Blinker transmitter
- F1 Th Thermoswitch (motor protection)
- R1 H Heating resistance

See legends on page 8

On-off function: Integral control version wiring diagram no. MSP 1110KC3---F17E1-KMSTP110/001

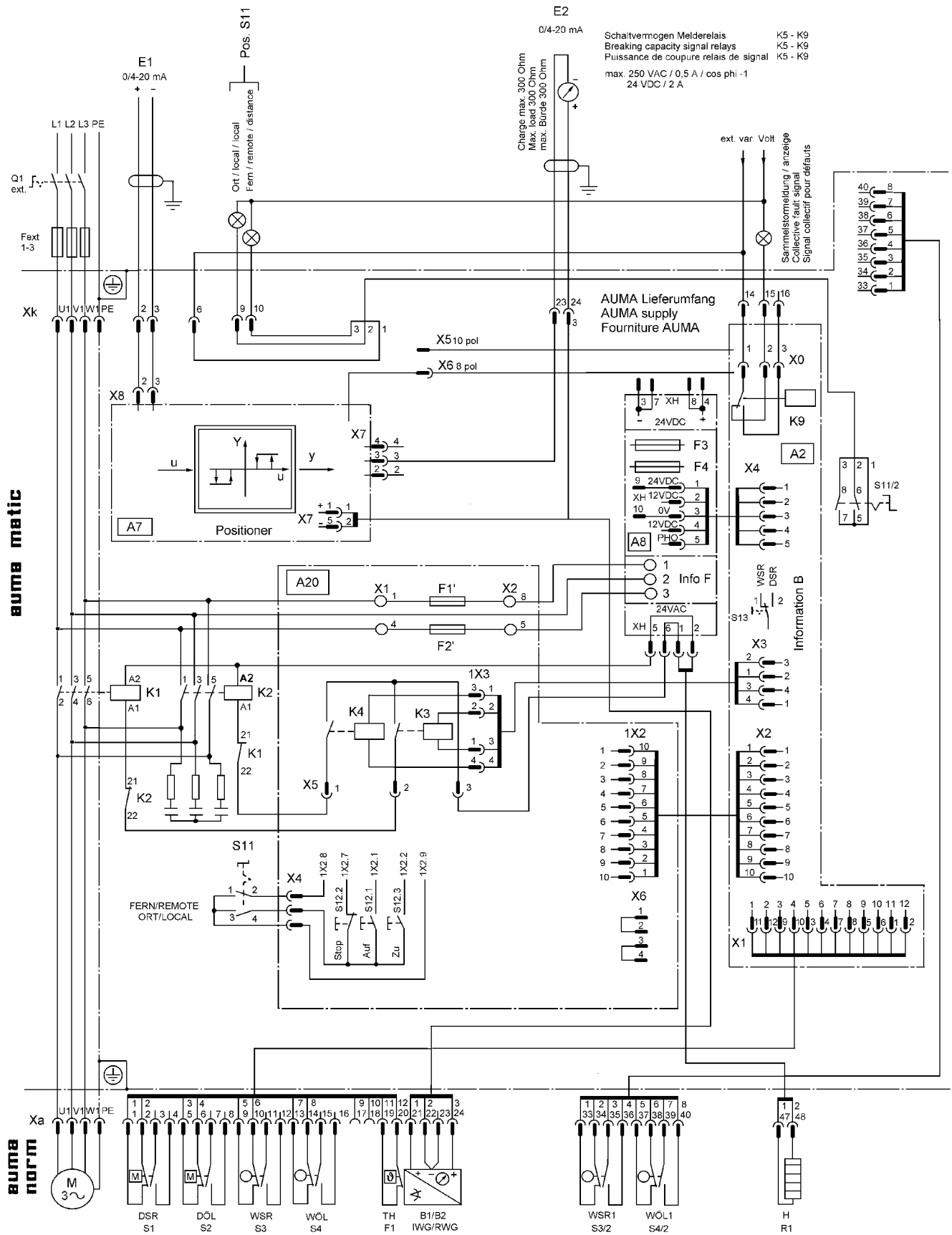


See legends on page 8

Throttling duty: wiring diagram MSP 111700---F17E1-KMSTP104/201

ACTELEC	31 SARM 07-5	200 SARM 07-5	400 SARM 10-1	500 SARM 07-5	800 SARM 10-1	950 SARM 07-5	1600 SARM 10-1
Basic equipments							
Opening and closing travel limit switches	Standard						
Mechanical adjustable travel stops	Standard on closing position only						
Opening and closing torque limit switches	Standard						
Heating resistance	Standard						
Emergency control Number of handwheel turns	350	510	510	1480	1480	3130	3130
Integral control with 4-20 mA integrated positioner	Standard						
Other constructions							
Explosion-proof protection	Yes						
Power supply							
3-phase 230 V or 400 V a.c.	Yes						
1-phase 230 V a.c.	Yes						
24 V or 48 V d.c.	Option						

Throttling duty: wiring diagram MSP 111700---F17E1-KMSTP104/201



Legends of wiring diagrams on pages 4, 5 and 7

S 1	DSR	Torque limit switch, closing, clockwise rotation
S 2	DÖL	Torque limit switch, opening, anti-clockwise rotation
S 3	WSR	Travel limit switch, closing, clockwise rotation
S 4	WÖL	Travel limit switch, opening, anti-clockwise rotation
S 3/2 S 4/2	WSR 1 WÖL 1	Travel limit switch in tandem operation with WSR/WÖL
S 5	BI	Blinker transmitter
F 1	Th	Thermoswitch (motor protection)
R 1	H	Heating resistance
A 1.0		Interface board
A 2		Logic board
A 7		Positioner board
A 8		Power supply board
A 20 / A 21		Signal and control board
F 1', F 2'		Primary fuses power supply

F 3, F 4	Secondary fuses
K 1, K 2	Reversing contactors
K 3, K 4	Control relays for contactors
K 5 to K 9	Signal relays
S 11 S 11/2	Selector switch Local - Off - Remote
S 12.1 S 12.2 S 12.3	Push button Open Push button Stop Push button Close
S 13	Change-over switch for travel limit or torque limit seating
V 14	LED *, phase sequence, phase failure
V 15	LED *, torque limit switch tripped in mid-travel
V 35	LED, command Close available from remote control centre
V 36	LED, command Open available from remote control centre
V37	LED, command Stop available from remote control centre

* If V 14 and V15 LED's are illuminated simultaneously, thermoswitch has tripped.

Information A:

If blinker transmitter (S5) is provided, running indication is possible (contacts open and close).

Direction Close: connections X_{K6} - X_{K7}

Direction Open: connections X_{K6} - X_{K8}

In the end position, the contacts remain closed.

In case signals of end positions must be included in a PLC-system, the blinking signal can be switched off, refer to AUMA MATIC operation instructions.

Information B:

With change-over switch S 13 position "1" end position Closed will be switched off by travel limit switch WSR (S3).

If the torque limit switch DSR (S 1) tips in mid-travel or in the end position, actuator will be switched off and a fault signal given.

With change-over switch S 13 in position "2", end position Closed will be switched off by torque limit switch DSR (S1). Travel limit switch WSR (S3) serves for signalisation, it must be set to operate shortly before reaching the end position Closed.

If the torque limit switch trips before the travel limit switch, this will stop the actuator and cause a fault signal.

For further programming of the logic board, e.g. for self retaining in mode Remote, refer to AUMA MATIC operation instructions.

Information D:

The following faults are registered by the electronics and fed to a relay with change-over contacts, from where they can be transmitted as a collective fault signal to the remote control centre:

- power failure,
- wrong phase sequence,
- phase failure,
- thermoswitch tripped,
- torque switch tripped in mid travel

This fault signal can be switched off by programming, refer to AUMA MATIC operation instructions.

Information E:

Input signals are according to DIN 19 240. Nominal current at input X_{K2} , X_{K3} and X_{K4} : 10 - 15 mA.

If internal voltage 24VDC is used for remote control, switching must be by potential-free contacts.

Information F:

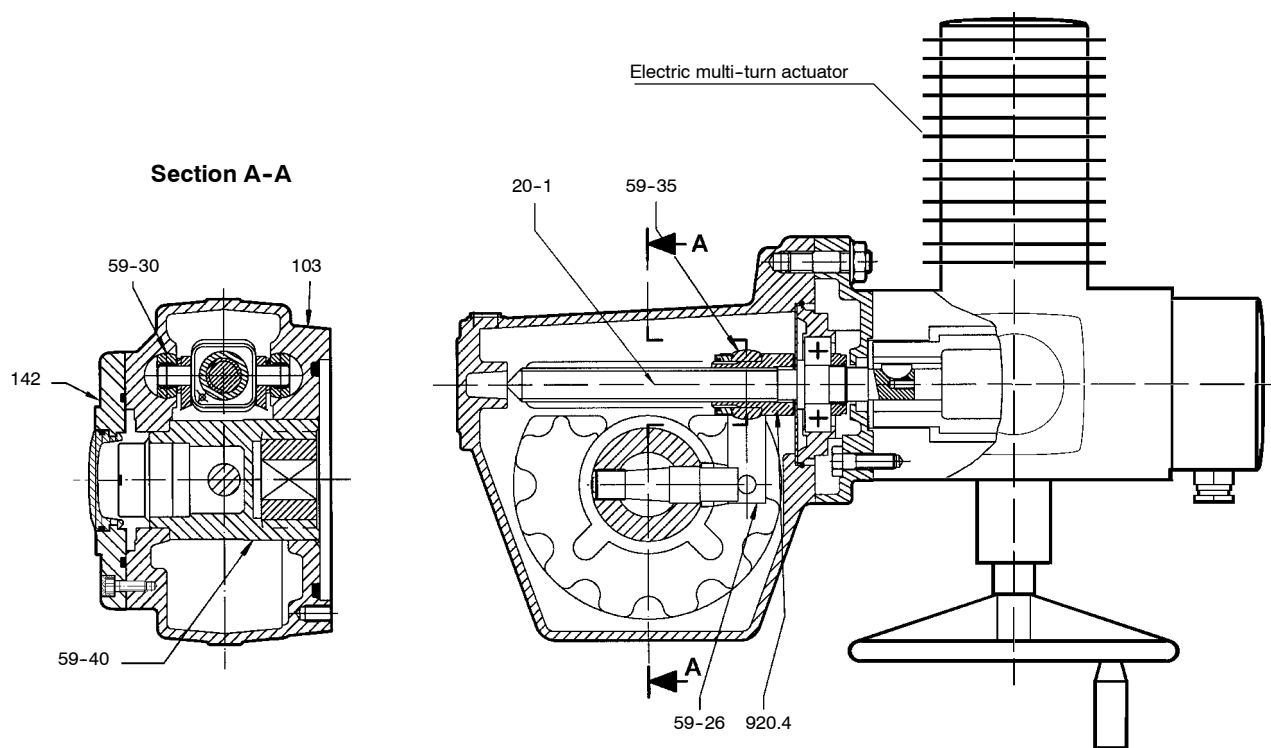
In case of wrong phase sequence or phase failure, the actuator does not run. The fault will be indicated at LED V14 on the interface board. For fault indications refer to information D.

Information G:

For monitoring, potential-free contacts are provided.

The internal control voltage (X_{K11} / 24V+ resp. X_{K5} / 24V-) should not be used for external lamps, relays, etc...

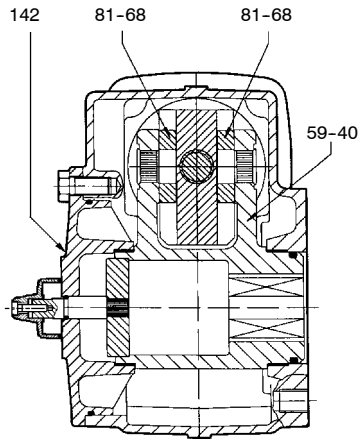
ACTELEC 31 - Construction



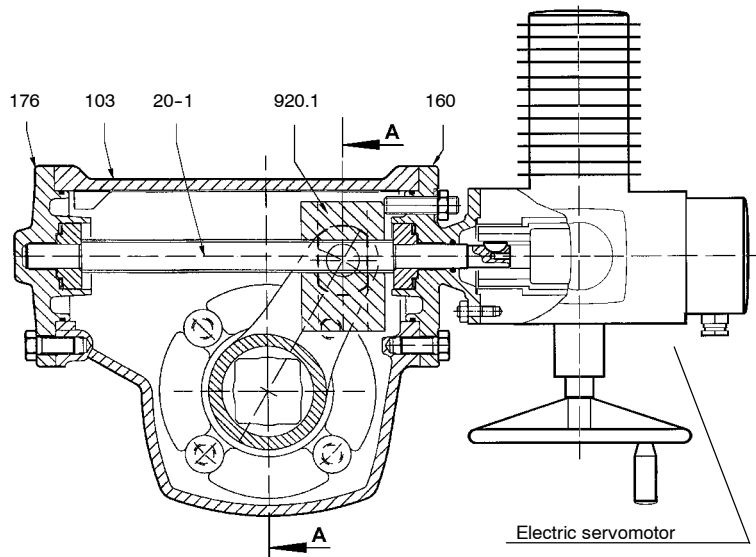
Item	Designation	Materials
103	Housing	JL 1040 cast iron
142	Cap	Thermoturcissable
20-1	Operating screw	Phosphated nickel coated steel
59-26	Connecting rod	Steel
59-30	Roller	Treated steel + PTFE
59-35	Arm	Steel
59-40	Chuck	Steel
920.4	Nut	Bronze
----	Electric servomotor housing	Cast iron and light alloy

ACTELEC 200 to 1600 - Construction

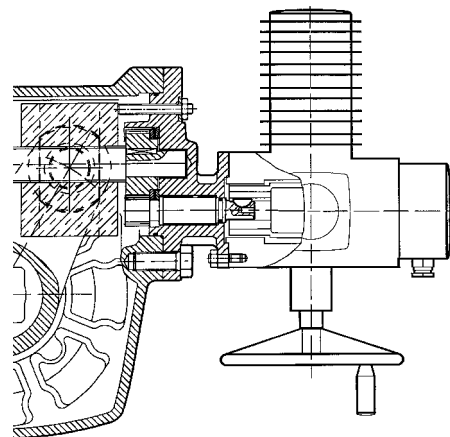
Section A-A



ACTELEC 200 and 400



ACTELEC 500 and 1600



ACTELEC 500 to 1600 actuators are equipped with input primary reduction gear

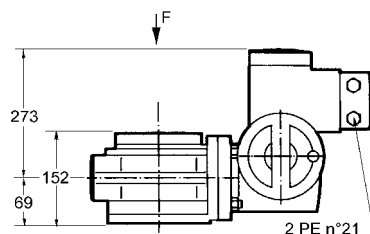
Item	Designation	Materials
103	Housing	JL 1040 cast iron or JS 1030 ductile iron
142	Cap	
160	Cover	
176	Bottom	
20-1	Operating screw	Phosphated nickel coated steel
59-40	Chuck + pointer shaft	JS 1030 ductile iron / stainless steel
81-68	Pressure pad	Nitrured steel
920.1	Operating nut	Bronze
-----	Electric actuator housing	Cast iron and light alloy

On-off function - 3-phase supply

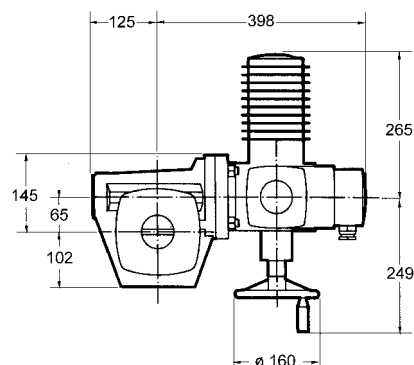
Overall dimensions (mm) and weight (kg)

ACTELEC 31

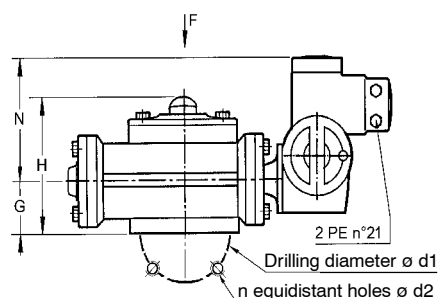
Weight: 47 kg



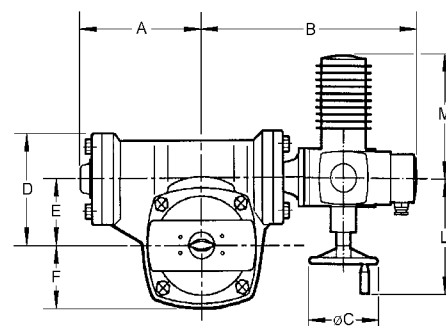
View from F



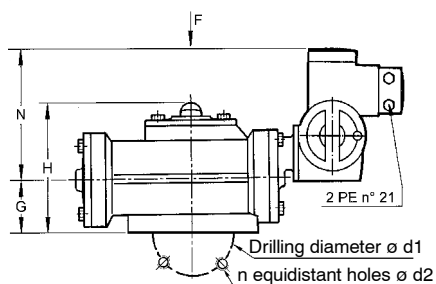
ACTELEC 200 and 400



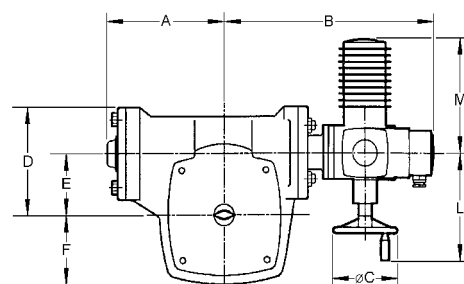
View from F



ACTELEC 500, 800, 950 and 1600



View from F



ACTELEC	Actuator	A	B	1 C	D	E	F	G	H	L	M	N	mounting plate ISO 5211				Weight kg
													Ref.	1 d1	2 d2	n	
200	SA 07-5	229	469	160	208	125	115	95	246	249	265	273	F16	165	M20	4	77
400	SA 10-1	229	471	200	208	125	115	95	246	254	282	275	F16	165	M20	4	81
500	SA 05-7	271	523	160	245	140	155	109	280	249	265	323	F16	165	M20	4	129
													F25	254	M16	8	
800	SA 10-1	271	525	200	245	140	155	109	280	254	282	325	F16	165	M20	4	133
													F25	254	M16	8	
950	SA 07-5	337	573	160	338	180	180	131	336	249	265	365	F25	254	M16	8	202
													F30	298	M20	8	
1600	SA 10-1	337	575	200	338	180	180	131	336	254	282	367	F25	254	M16	8	206
													F30	298	M20	8	

Mounting on valves

The actuator can be positioned in four position, at intervals of 90°.

Unless otherwise stated, the actuator is mounted according to the arrangement N position 1.

