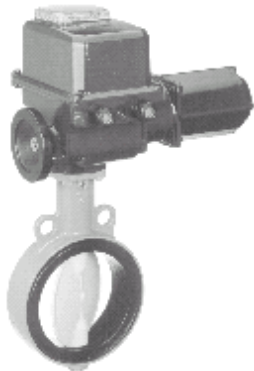


ACTELEC 3 to 1600 electric actuators



Direct 1/4 turn
actuator



Actuator
with multi-turn servomotor
associated with a reducer

Direct 1/4 turn electric actuators
ACTELEC 3, 6, 12, 25, 50, 100 and 150
Output torques up to 1500 Nm

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

Output torques up to 16000 Nm

AMRI is ISO 9001 approved

Summary

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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 ¼ 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.

This range is constituted in two series:

- direct ¼ turn actuators, with irreversible kinematics, covering output torques up to 1500 Nm,
- ¼ turn actuators, with irreversible kinematics reducer associated with a multi-turn electric servomotor, covering output torques up to 16000 Nm.

Protection

They are hose and fine dust proof and are protected against accidental immersion: protection degree IP 67.

Motor: insulation class F.

External coating

- Direct ¼ turn actuators:
epoxy paint, thickness 60 µm, color grey.
- Actuators with reducer and electric servomotor:
 - reducer: polyurethane paint, thickness 80 µm, color dark grey RAL 7016,
 - electric servomotor: polyurethane paint, thickness 80 µm, color grey RAL 9007.

Working temperature range

From -20° C up to +70° C.

Production range

Type	Nominal output torque (Nm)	ISO 5211 mounting plate*	Maximal allowable dimensions for the shaft			
			Height	Driving by square	Driving by flat	Driving by key
Direct ¼ turn actuators						
ACTELEC 3	40	F05	24	11	11	12
ACTELEC 6	70	F05 - F07	30	16	14	14
ACTELEC 12	150	F05 - F07	32	19	19	18
ACTELEC 25	250	F07 - F10	40	25	22	22
ACTELEC 50	520	F07 - F10	45	25	22	22
ACTELEC 100	1000	F12	55	36	36	42
ACTELEC 150	1500	F14	65	50	46	50
Actuators with reducer and electric servomotor						
ACTELEC 31	1000	-----	40	36	36	40
ACTELEC 200	2000	F16	80	60	55	72
ACTELEC 400	4000	F16	80	60	55	72
ACTELEC 500	5000	F16 - F25	95	70	75	80
ACTELEC 800	8000	F16 - F25	95	70	75	80
ACTELEC 950	9500	F25 - F30	110	90	85	120
ACTELEC 1600	16000	F25 - F30	110	90	85	120

* 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 (except on ACTELEC 3, 6 and 12 actuators).
- 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.

Direct 1/4 turn actuators: ACTELEC 3 to 150

ACTELEC 3 to 150 electric actuators are based on a direct ¼ turn servomotor with a mounting interface in accordance with ISO 5211 standard.

These actuators are available in on-off function or throttling duties.

Manufacturing range - Characteristics

On-off function: wiring diagram no. S 50000

ACTELEC		3	6	12	25	50	100	150
Nominal torque (Nm)		35	70	150	250	520	1000	1500
Operating time in seconds	Standard	11	6	15	10	30	60	60
	Option			25	5 or 60			

Basic equipments

Opening and closing travel limit switches	Standard						
Mechanical adjustable travel stops	Standard						
Opening and closing torque limit switches				Standard			
Heating resistance 6 W	Standard						
Emergency control Number of handwheel turns	24	20	20	11	8	14	14

Other constructions

Continuous duty	Yes	
Integral control		Yes - Refer to wiring diagram no. S 20000
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 no. S 25000 + S 50000

ACTELEC		6	12	25	50	100
Nominal torque (Nm)		70	150	250	520	1000
Standard operating time in seconds		60	25	60	60	60

Basic equipments

Opening and closing travel limit switches	Standard				
Mechanical adjustable travel stops	Standard				
Opening and closing torque limit switches			Standard		
Heating resistance 6 W	Standard				
Emergency control Number of handwheel turns	20	20	11	8	14
Integral control with 4–20 mA integrated positioner	Standard – Refer to wiring diagram no. S 25000				

Other construction

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				

Direct 1/4 turn actuators: ACTELEC 3 to 150

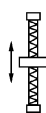
On-off function: basic wiring diagram no. S 50000

ACTELEC 25 to 150

(Servomotor with
limit torque device)



Motor terminals
(see diagram below)

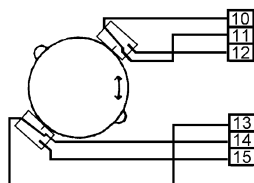


Limit torque switch
direction of rotation 1

Limit torque switch
Direction of rotation 2

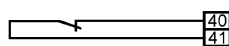
Function of switches
Direction of rotation
1 : anti-clockwise
(normally opening)
2 : clockwise
(normally closing)

- Limit torque switches give short duration contact only.
- Travel limit switches give maintained contact.



Travel limit switch
direction of rotation 1

Travel limit switch
direction of rotation 2



Thermoswitch
(motor protection)

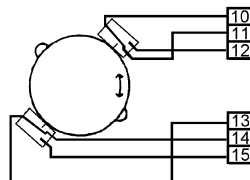
Direction of rotation seen on opposite side of fixing flange of actuator.

ACTELEC 3 to 12

(Servomotor without
limit torque device)



Motor terminals
(see diagram below)



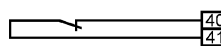
Travel limit switch
direction of rotation 1

Travel limit switch
direction of rotation 2

Function of switches

Direction of rotation
1 : anti-clockwise
(normally opening)

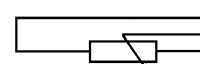
2 : clockwise
(normally closing)



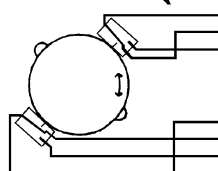
Thermoswitch
(motor protection)

Direction of rotation seen on opposite side of fixing flange of actuator.

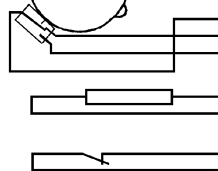
Optional accessories



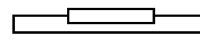
Potentiometer



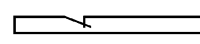
Extra travel limit switch
Direction of rotation 1



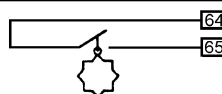
Extra travel limit switch
Direction of rotation 2



Heating resistance



Safety for handwheel declutching

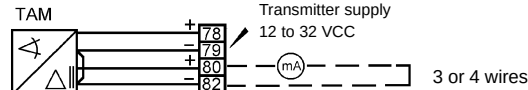
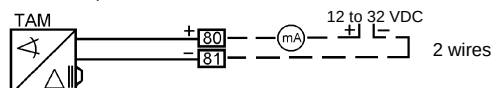


Flashing contact
(remote indication of motor running)



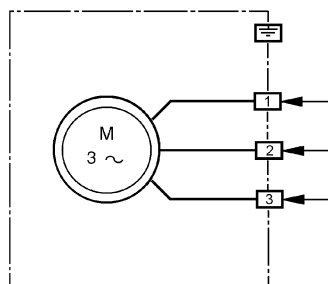
Second potentiometer

Electronic position transmitter TAM 4-20 mA



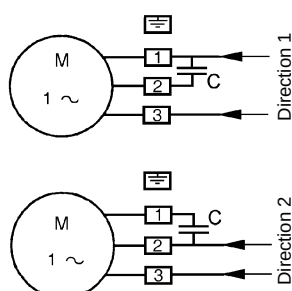
Motor

3-phase A.C.



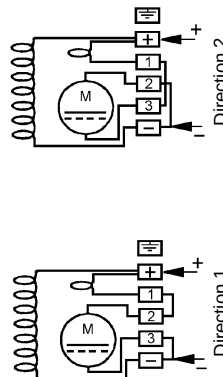
Note: 3-phase direct direction = direction 2

1-phase A.C.



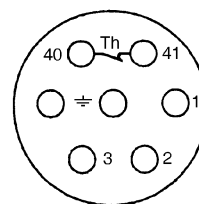
Note: the capacitor C is :
- integrated in ACTELEC 3 to 12
- supplied separately for the other types

D.C.



Explosion proof version
EEXed

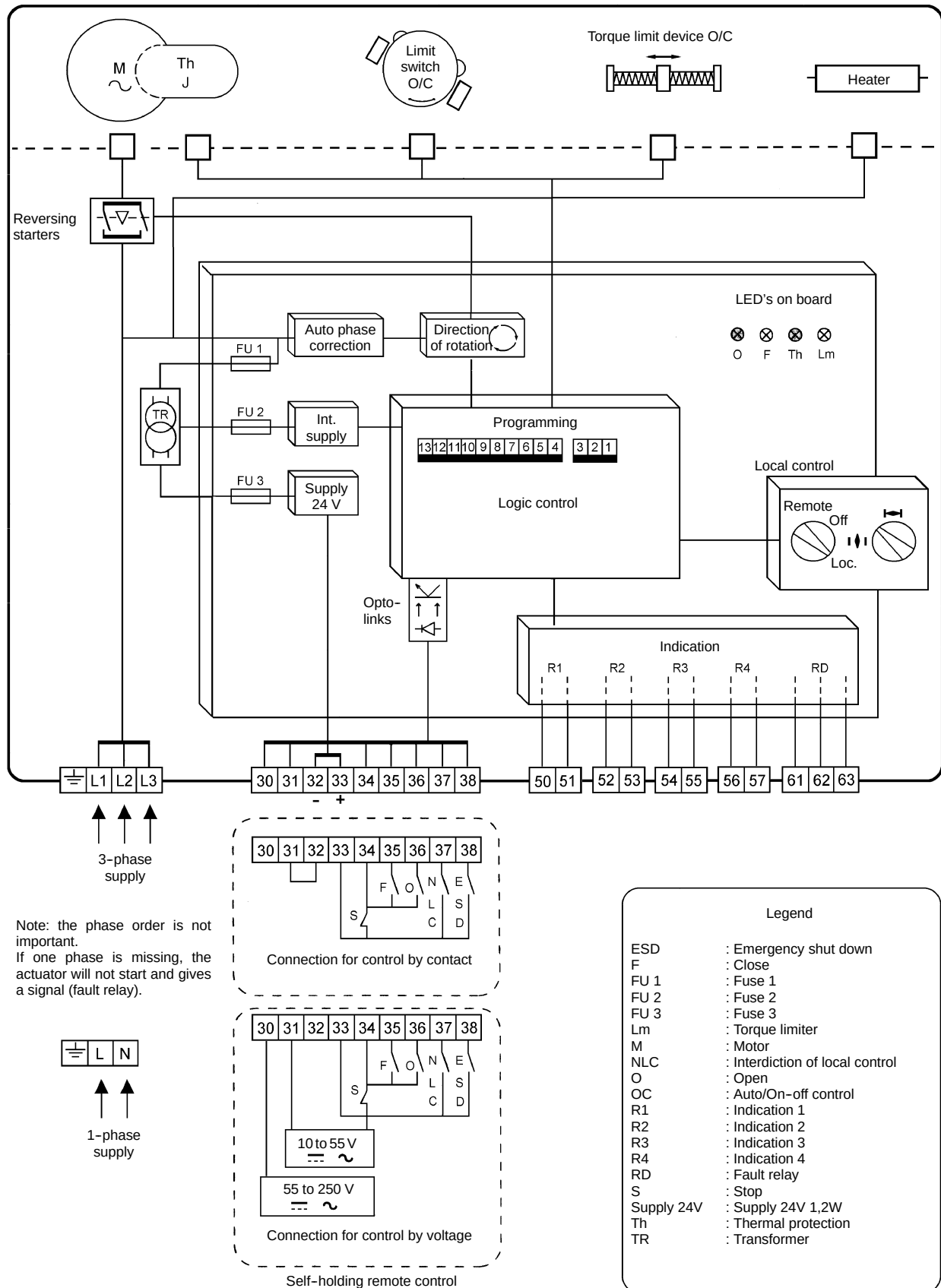
Th : thermal protection
integrated in coiling



Independant terminal box.
The capacitor is supplied
separately (single phase).

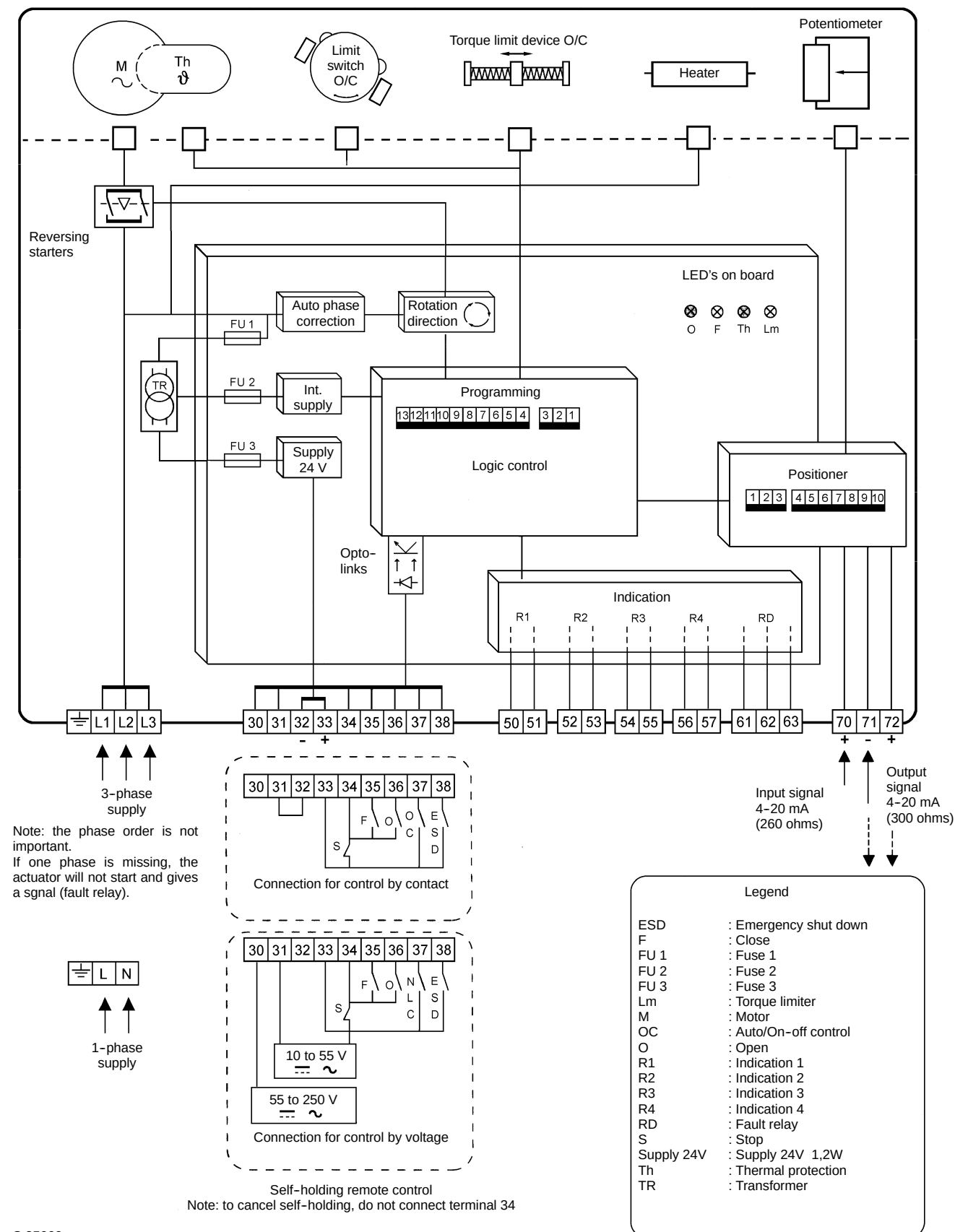
Direct 1/4 turn actuators: ACTELEC 3 to 150

On-off function: integral control version – wiring diagram no. S 20000



Direct 1/4 turn actuators: ACTELEC 3 to 150

Throttling duty positioner 4-20 mA: wiring diagram no. S 25000

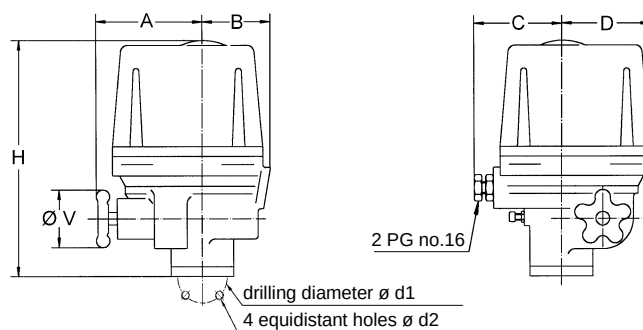


Direct 1/4 turn actuators: ACTELEC 3 to 150

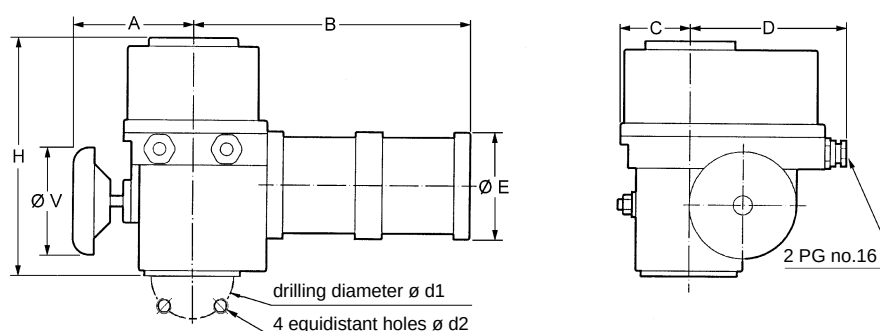
On-off function - 3-phase supply

Overall dimensions (mm) and weight (kg)

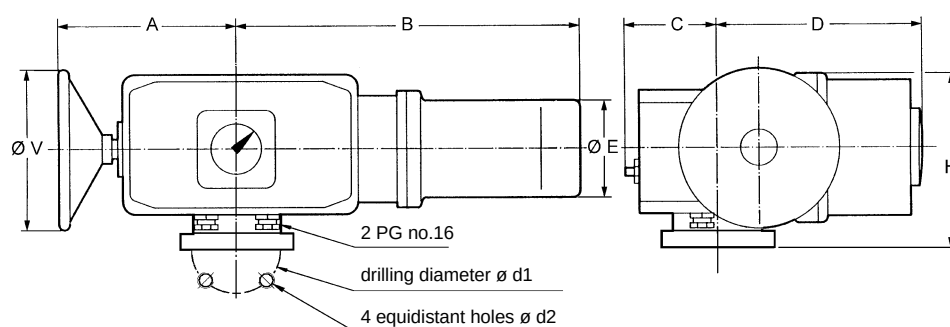
ACTELEC 3



ACTELEC 6 and 12



ACTELEC 25, 50, 100 and 150



Type	A	B	C	D	Ø E	H	Ø V	Mounting plate ISO 5211			Weight kg
								ref.	Ø d1	Ø d2	
ACTELEC 3	134	59	93	90	---	234	60	F05	50	M6	5
ACTELEC 6	90	200	65	150	106	215	60	F05	50	M6	5,7
								F07	70	M8	
ACTELEC 12	112	215	65	150	106	215	100	F05	50	M6	7,5
								F07	70	M8	
ACTELEC 25	187	312	89	226	139	177	165	F07	70	M8	18
								F10	102	M10	
ACTELEC 50	187	340	89	226	139	177	250	F07	70	M8	18
								F10	102	M10	
ACTELEC 100	187	392	134	284	139	167	250	F12	125	M12	26
ACTELEC 150	187	392	134	284	139	167	250	F14	140	M16	28

ACTELEC 31 to 1600 1/4 turn actuators

ACTELEC 31 to 1600 actuators are based on a reducer with irreversible kinematics motorized by a multi-turn electric servomotor 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 servomotor type	Servomotor 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	Servomotor 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.

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
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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						

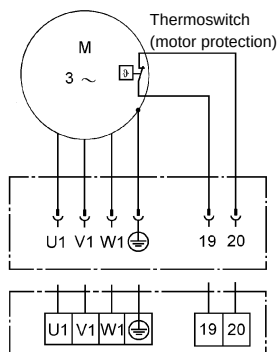
ACTELEC 31 to 1600 1/4 turn actuators

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

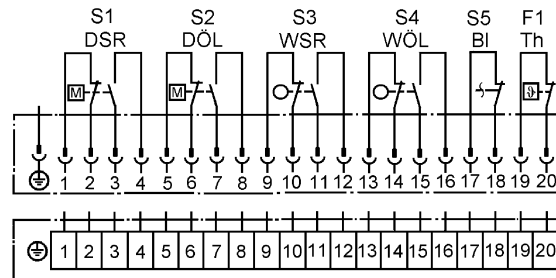
ACTELEC	31 SARM 07-5	200 SARM 07-5	400 SARM 10-1	500 SARM 07-5	800 SARM 10-1	950 SARM 07-5	1600 SARM 10-1
Basic equipments							
Opening and closing travel limit switches	Standard						
Mechanical adjustable travel stops	Standard on closing position only						
Opening and closing torque limit switches	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						

On-off function : basic wiring diagram no. KMS TP 110/001

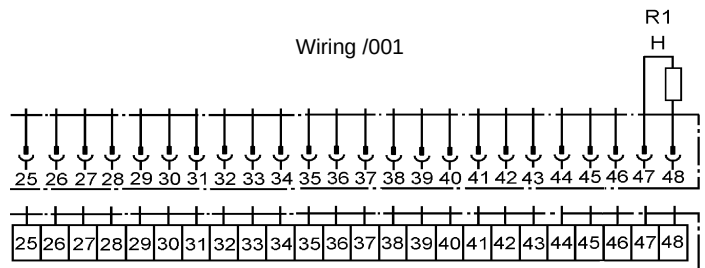
Motor wiring



Wiring TP 110



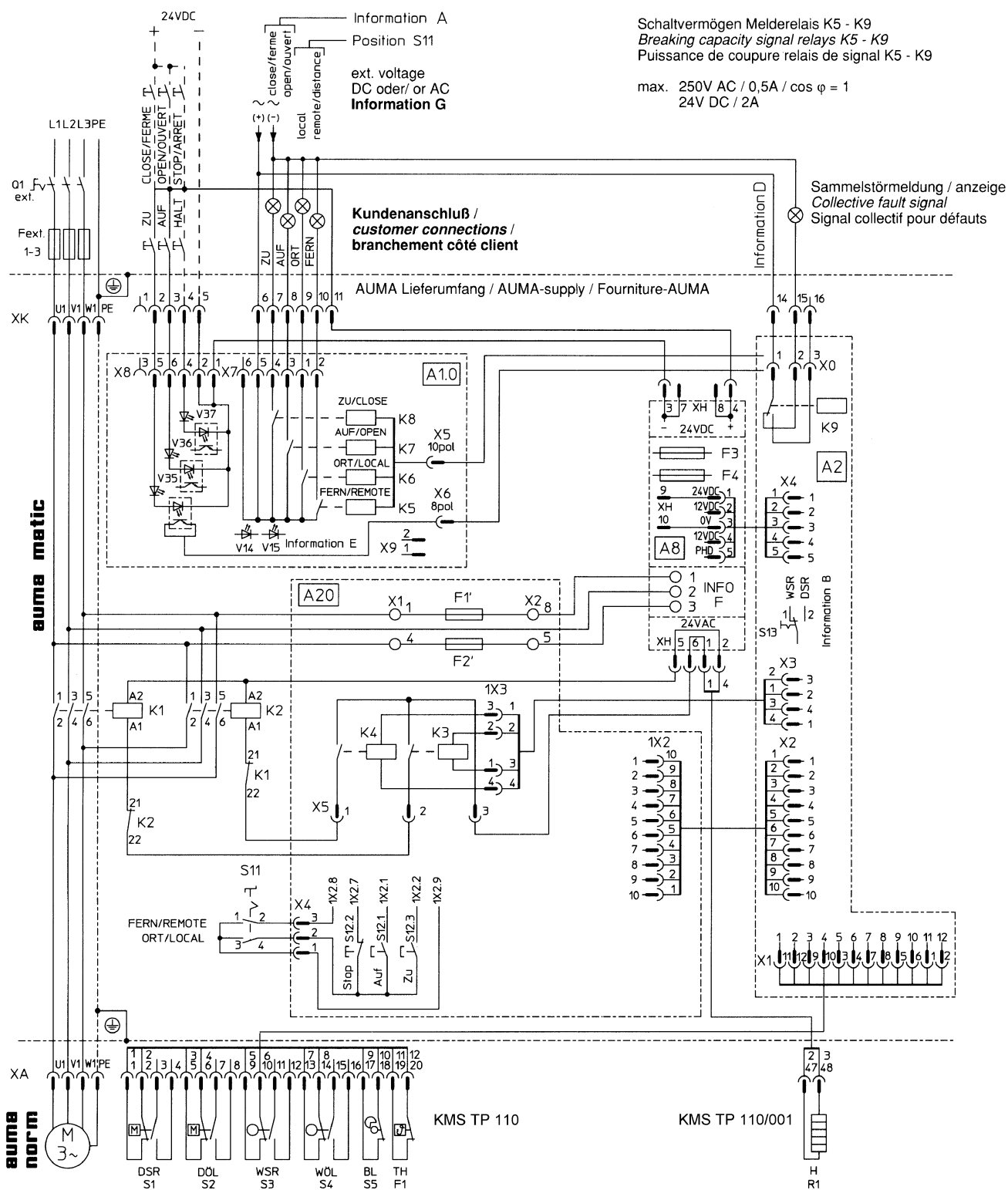
Wiring /001



- 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

ACTELEC 31 to 1600 1/4 turn actuators

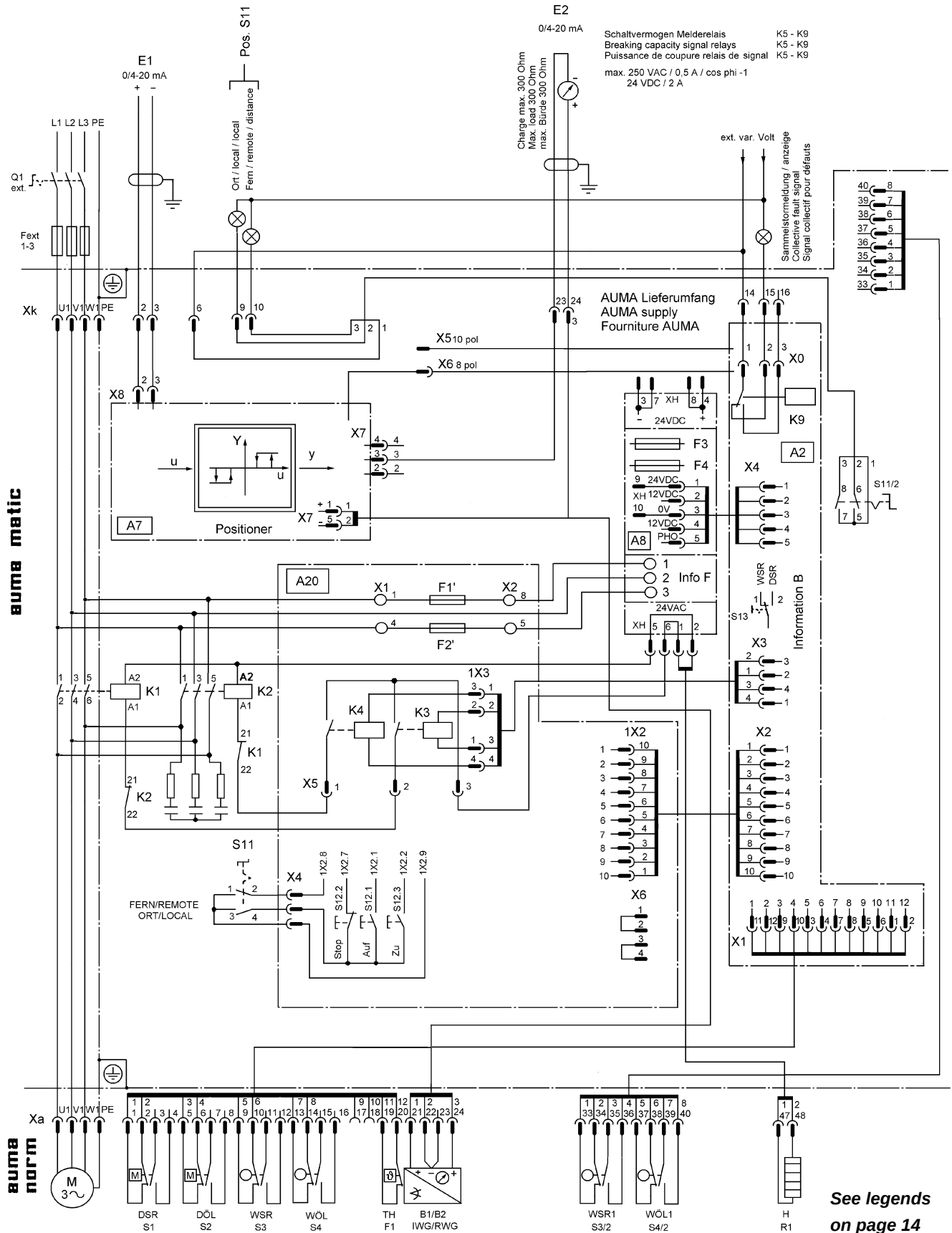
On-off function: integral control version – wiring diagram no. MSP 1110KC3---F17E1-KMSTP110/001



See legends on page 14

ACTELEC 31 à 1600 1/4 turn actuators

Throttling duty with 4-20 mA positioner: wiring diagram no. MSP 111700---F27E1-KMSTP104/201



ACTELEC 31 to 1600 1/4 turn actuators

Legends of wiring diagrams on pages 11 and 12

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	Bl	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 for 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 V14 and V 15 LED's are illuminated simultaneously, thermoswitch has tripped.

Information A:

If blinker transmitter (S 5) 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 in position "1" end position Closed will be switched off by travel limit switch WSR (S 3). If the torque limit switch DSR (S 1) trips 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 (S 1). Travel limit switch WSR (S 3) 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 24 VDC 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 V 14 on the interface board. For fault indications refer to Information D.

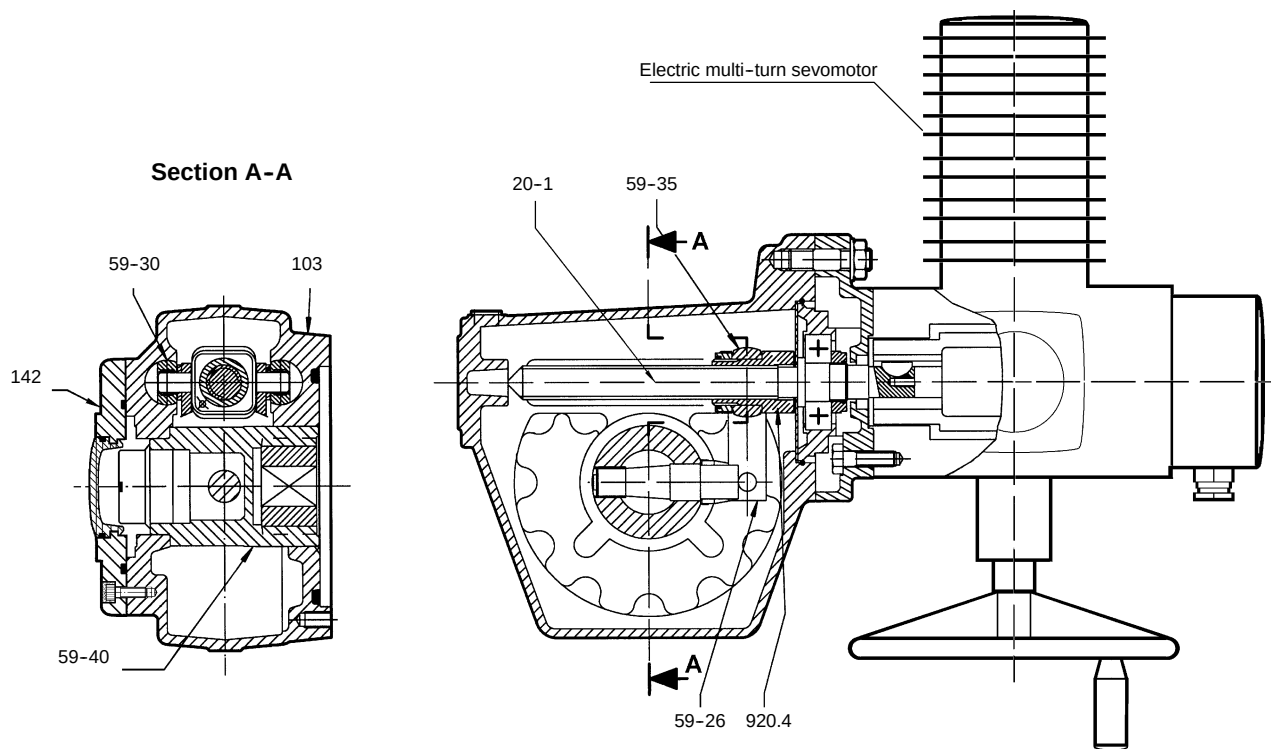
Information G:

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 to 1600 1/4 turn actuators

ACTELEC 31 - Construction



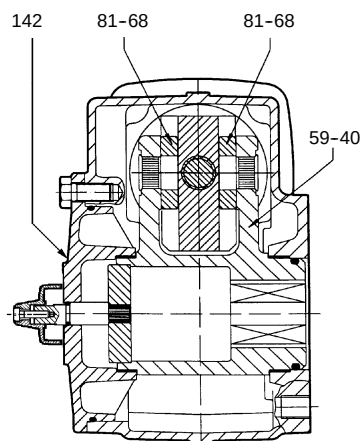
Item	Designation	Materials
103	Housing	JL 1040 * cast iron
142	Cap	Thermoturcissable
20-1	Operating screw	Phosphated nickel coated steel
59-26	Connecting rod	Steel
59-30	Roller	Treated steel + PTFE
59-35	Arm	Steel
59-40	Chuck	Steel
920.4	Nut	Bronze
----	Electric servomotor housing	Cast iron and light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

* Previous standards: DIN GG 25 / NF FGL 250

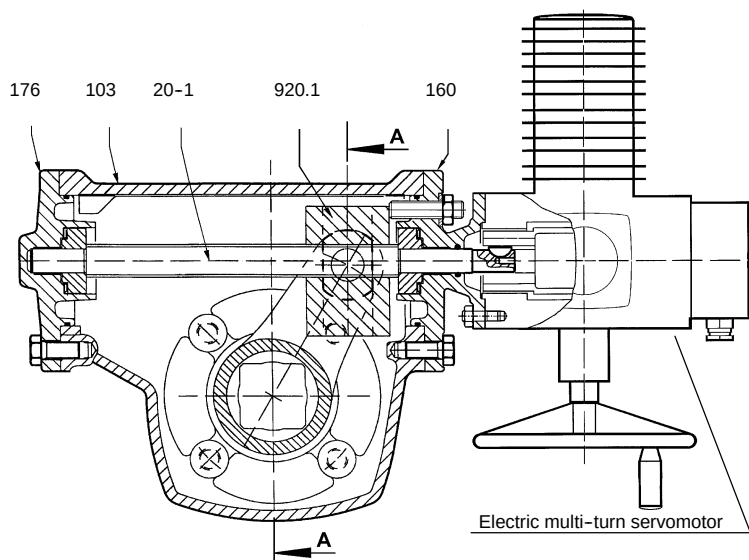
ACTELEC 31 to 1600 1/4 turn actuators

ACTELEC 200 to 1600 - Construction

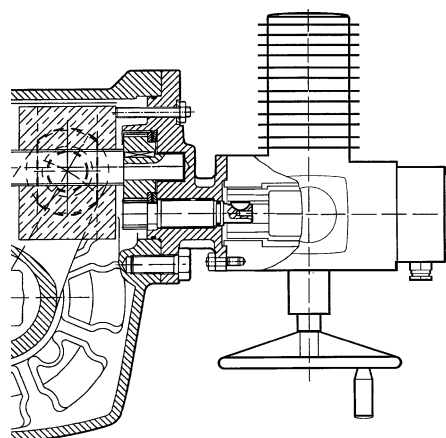
Section A-A



ACTELEC 200 and 400



ACTELEC 500 to 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	Phosphated nickel coated steel
20-1	Operating screw	
59-40	Chuck + pointer shaft	
81-68	Pressure pad	Nitrured steel
920.1	Operating nut	Bronze
-----	Electric servomotor housing	Cast iron and light alloy

* Previous standard: DIN GG 25 / NF FGL 250

** Previous standard: DIN GGG 40 / NF FGS 400-15

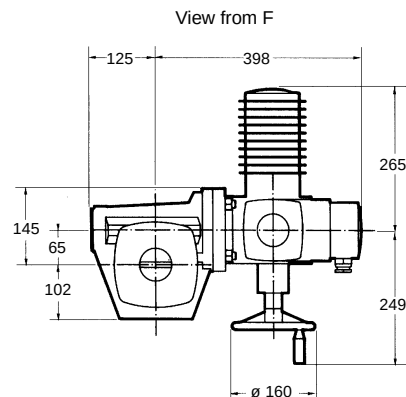
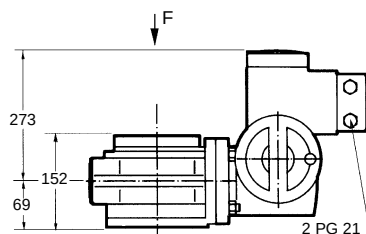
ACTELEC 31 to 1600 1/4 turn actuators

On-off function - 3-phase supply

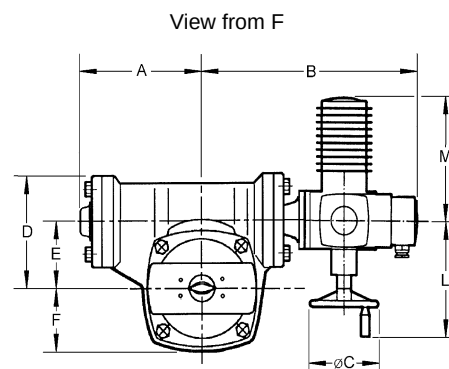
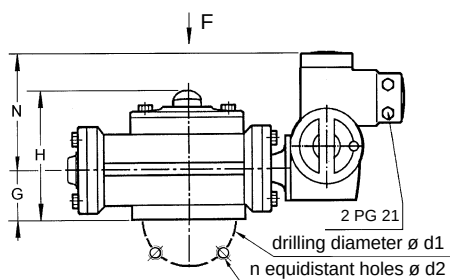
Overall dimensions (mm) and weight (kg)

ACTELEC 31

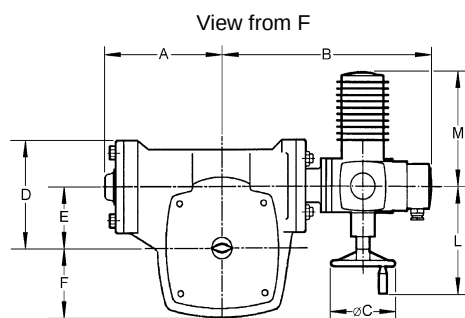
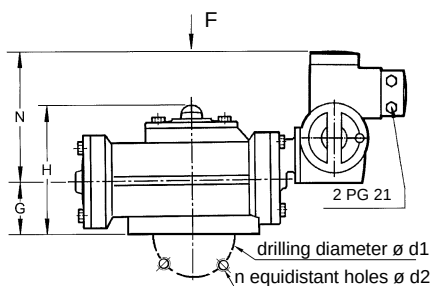
Weight: 47 kg



ACTELEC 200 and 400



ACTELEC 500, 800, 950 and 1600

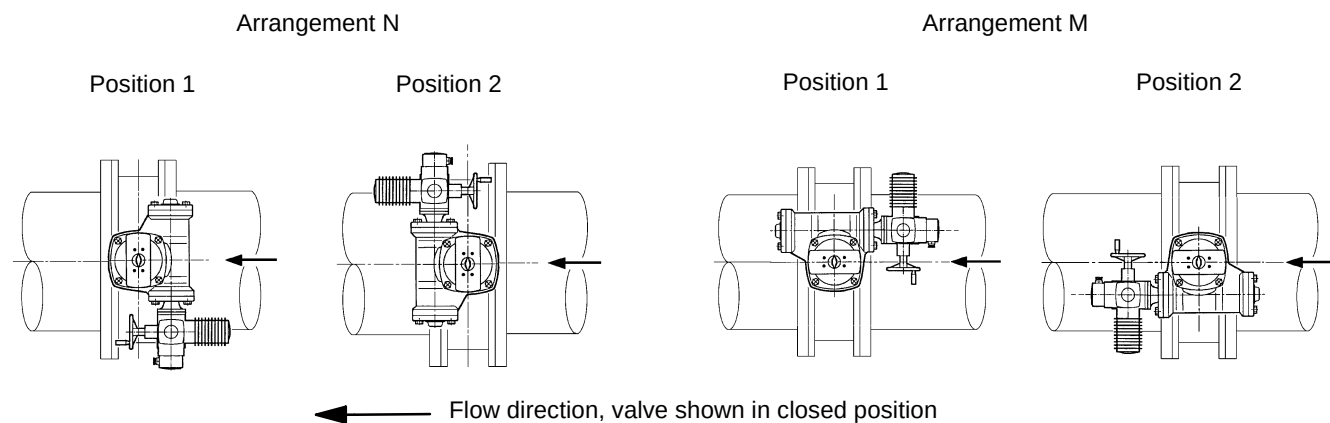


ACTELEC	Servo-motor	A	B	Ø C	D	E	F	G	H	L	M	N	Mounting plate ISO 5211				Weight kg
													ref.	Ø d1	Ø d2	n	
200	SA 07-5	229	469	160	208	125	115	95	246	249	265	273	F16	165	M20	4	77
400	SA 10-1	229	471	200	208	125	115	95	246	254	282	275	F16	165	M20	4	81
500	SA 05-7	271	523	160	245	140	155	109	280	249	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	

ACTELEC 31 to 1600 1/4 turn actuators**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.





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