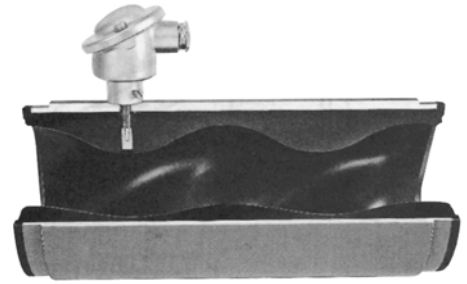


# Technical Data and Operating Instructions Thermal Dry Running Protection ATLS-T1



Operational data for thermal dry running protection according to order data sheet

Order No.:

Ident No. ATLS-T1:

Machine No.:

Type Code ATLS-T1:

## 1. General

### 1.1 Dry running

Dry running occurs when the inlet side of the winding medium fails. The thermal energy produced in the conveying components of the eccentric screw pump from dry friction and churning is hereby no longer dissipated sufficiently and as a result the elastomer on the inner contour of the stator is already thermally destroyed after a few revolutions.

### 1.2 Application / field of application

The protection against dry running represents a safety device especially for eccentric screw pumps. Its task consists in the prevention of operating situations, in which the pump/system is damaged by dry running.

### 1.3 Guarantee

Our liability for defects in the consignment is stipulated in our terms of delivery. No liability shall be assumed for damage, which results from non-compliance with the operating and maintenance instructions and the operating conditions.

## 2. Safety

The safety advice listed under point 2 in the maintenance and operating instructions for the eccentric screw pump should be observed.

### 2.1 Additional installation

An additional installation should be carried out exclusively by trained skilled staff in accordance with point 4.

## 3. Description

### 3.1 Construction

The ATLS-T1 protection against dry running consists of a thermostat (controller) and a temperature sensor (Pt 100) which measures the operating temperature in the stator elastomer within the contact plane of rotor and stator. The elastomer temperature increases at the dry running inlet and the controller switches off the pump depending on a set temperature limit.

## 3.2 Technical data

### 3.2.1 Controller



Figure 1:  
ATLS-T1 Controller

Type of construction:	DIN-housing of SCS 45 x 75 x 105 for mounting rail in accordance to EN 50 022
Degree of protection:	IP 20, terminals safe to touch
Supply voltage:	230 V AC, 47 ... 63 Hz, 5 VA 115 V AC, 47 ... 63 Hz, 5 VA 24 V DC, max. 80 mA
Ambient temperature:	-10 ... +55 °C
Storage temperature:	-20 ... +70 °C
Air humidity:	0 ... 95 %
Input:	Pt 100 2-Leiter
Setting range:	0 ... 120 °C
Output:	1 floating two-way contact
Relay:	Picked up in the acceptance region, LED shines "yellow"
Switching capacity:	3 A, 250 V~ resistive load 1 A, 250 V~ inductive load 0,3 A, 250 V=
Hysteresis:	2%
Operational monitoring:	
Supply voltage:	"green" LED shines (voltage)
Temp. Limit exceeded:	"yellow" LED goes out (rel.)
Sensor interruption:	"red" LED shines (F-br.)
Short circuit:	"red" LED shines (F-br.)
Connecting lead:	1,5 mm <sup>2</sup> NYM
to extended to:	100 m

## 3.2.2 Sensor system

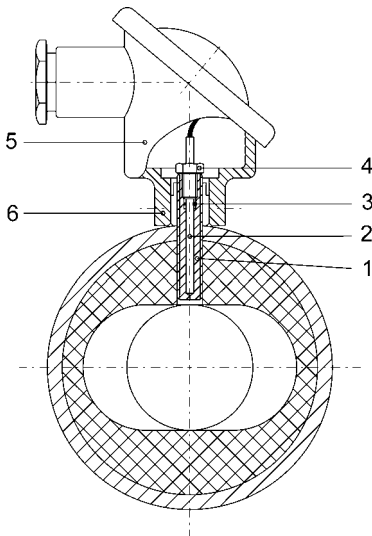


Figure 2: ATLS-T1 Sensor system

1. Sensor sleeve 1.4571
2. Pt 100 temperature sensor,  $\varnothing$  3 mm 1.4571, two-wire technology
3. O-Ring, 3,1 x 1,6 NBR
4. M6 x 10 clamping screw, 1.4401
5. Type B connecting head, DIN 43 729, IP 54, aluminum
6. clamping sleeve 1.4571

## 3.3 Dimensions of connecting heads

### 3.3.1 Standard connection head, Type B DIN 43 729

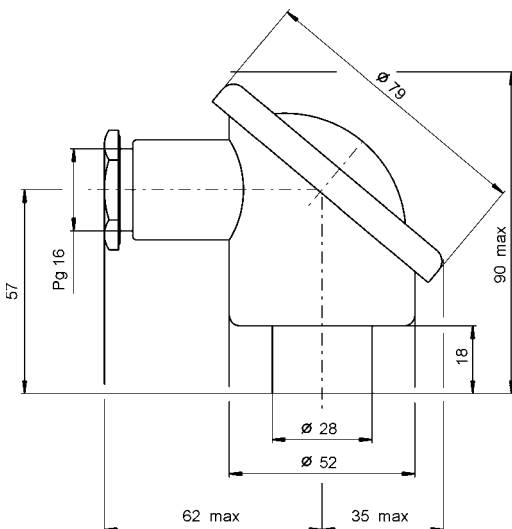


Figure 3:  
Connection head, Type B DIN 43 729

### 3.3.2 Connection head for series 52 dosage pumps, type MA

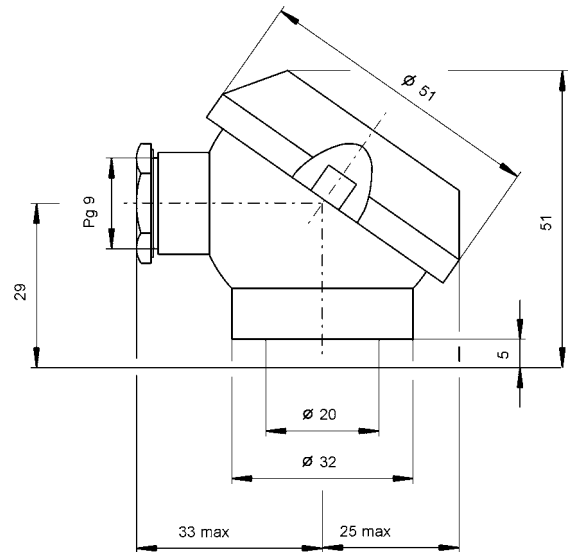


Figure 4:  
Connection head, Type MA

## 3.4 Design

Depending on type of stator and size, different installation dimensions should be considered and different sensor lengths used. The correct assignment of the individual elements comes from the type code described below.

3.4.1 Type code

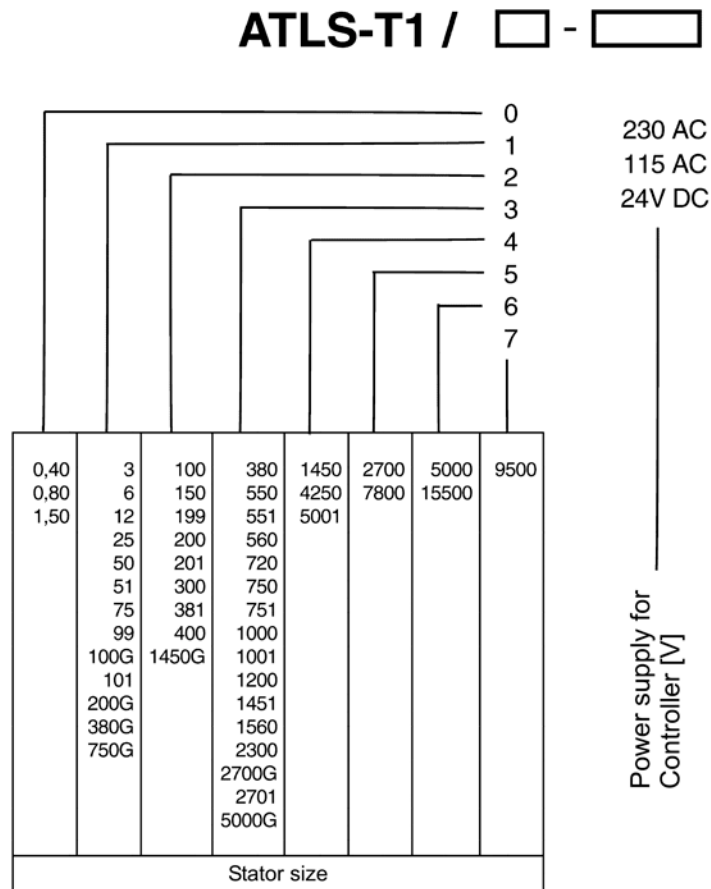


Figure 5:  
Type Code

4. Installation / connection

4.1 Assembly of sensor system

The installation and adjustment of the temperature sensor is normally carried out at the manufacturing plant so that the sensor then only has to be connected to the controller (please see figure 10). If the customer wishes to install the sensor in already existing stators, the rebuilding work should be carried out as described below.

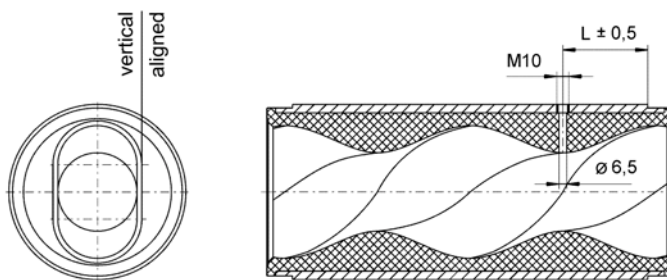


Figure 6:  
Stator for ATLS-T1

Stator size	Length L [mm]
0003	39
0006	54
0012	16
0025	21
0050	28,5
0100	38
0200	49
0380	60,5
0750	82
1450	107
2700	133
5000	173,5
9500	221,5
0099	65
0199	88
0400	112
0550	99
0720	137
1000	108
1560	182

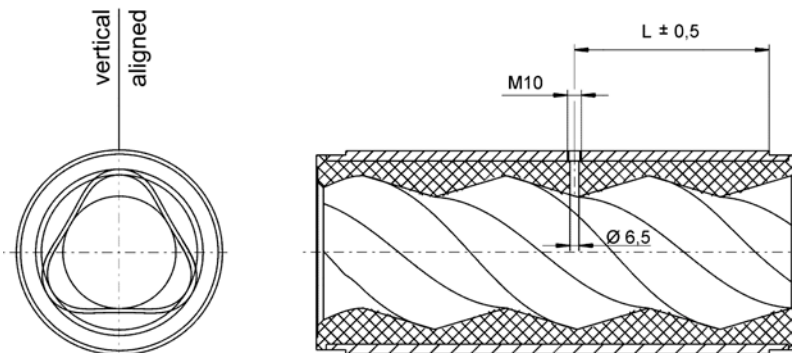


Figure 7:  
Stator for ATLS-T1

Stator size	Length L [mm]
38	52,5
75	69,5
150	88,5
300	112
560 (551)	137
850	161,5
1200 (1001)	184
2300	233
4250	286
7800	355
0051	76,5
0101	95
0201	117
0381	142
0751	189,5
1451	227,5
2701	273,5
5001	338,5

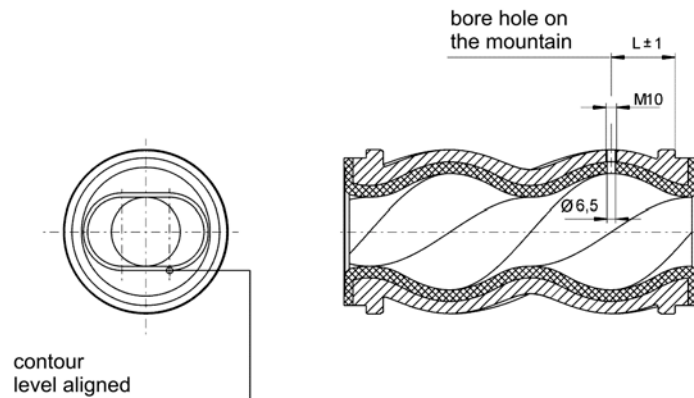


Figure 8:  
Stator for ATLS-T1

Stator size	Length L [mm]
100 G	38
200 G	49
380 G	61
750 G	82
1450 G	107
2700 G	133
5000 G	174

- Align the stator internal surface according figures 6, 7 and 8.
- Bore holes in accordance with figures 6, 7 and 8.
- Screw in the sensor sleeve (section 1, figure 2) until just before internal contour of the stator. The precise screw-in depth can only be carried out later.
- Assembly of the in the stator in accordance with maintenance and operating instructions for eccentric screw pumps. The measuring point must be established upwards and on the inlet side for this.
- Commission pump complying with the operating instructions.
- Slowly screw in sensor sleeve with the aid of key surfaces until there is a slight contact with the rotating rotor. Then the sleeve should be turned back 2...3 revolutions.

- Grease temperature sensor and push through the O-ring into the sensor sleeve until dead stop.
- Tighten terminal screw.
- Push connection head onto terminal sleeve and screw tightly. Assign the sensor cables in the connection head onto terminal sockets.

The sensor system is then ready for use.

#### 4.2 Installation of the controller

The installation of the controller is carried out via a terminal socket, snap on onto 35 mm standard rails in accordance with DIN EN 50 022.



Screwing the sensor sleeve in too deeply and/or not turning it back result in contact between sleeve and rotor. This results in the destruction of the rotor and the sensor sleeve! Loud tapping noises during the pump operating also indicate a screw-in depth, which is too deep.

- Lock sensor sleeve using section 6 of setscrew
- Insert the O-ring into the sensor sleeve.
- Push terminal screw (section 4) onto temperature sensor

### 4.3 Electrical connection of controller

The electrical connection is carried out in accordance with terminal assignment figure 9.

The supply terminals on the front can be removed. The circuitry of the power section should be carried out so that an automatic restarting is not possible after “dry running” initiated.

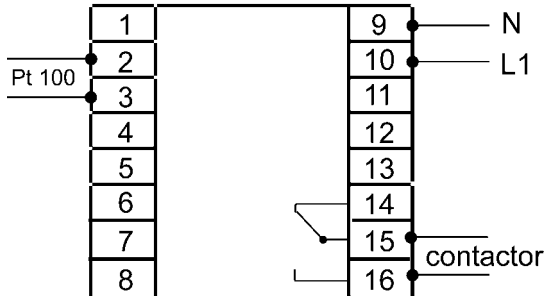


Figure 9:  
Connection of controller

### 4.4 Electrical connection of connection head

#### 4.4.1 Electrical connection of connection head type B DIN 43727 and connection head type MA

The connection between controller and connection heads is carried out using a customary connecting lead, e.g. 1.5 mm<sup>2</sup> single nylon enamelled wire. The lead length should not exceed 100m. Within the connection head, the connecting lead should be connected with the aid of the internal terminals using both cores of the Pt 100 temperature sensor.

## 5. Setting / adjustment

The green LED (volt.) should light on the front side of the controller after correct connection.

The set shutdown temperature can be adjusted corresponding to the range between 0 and 120° C using the variable transformer. It should be 10...20° C above the operating temperature of the stator.

The setting is made easier if it is carried out when the pump is running. The variable transformer is hereby turned across the range so far until the operating point has been reached. This can be seen with the yellow LED (rel.) on the front side.

Normal operating state:           yellow LED (rel.) is on  
Temperature limit exceeded:    yellow LED (rel.) is off

Then the shutdown temperature 10...20° C should be changed again.

The red LED (F-br.) on the front side signals either short circuit or cable breakage in the sensor lead.

## 6. Operating conditions / restrictions

As this measuring system measures neither filling nor flow velocity within the suction pipe, but the temperature rise within the stator elastomer, it is extensively independent from the substance properties of the conveyor.

Abrasive media can however result in increased mechanical wear and therefore in the destruction of the stator starting from the measuring point of the thermocouple assembly.

Variable operating temperatures may possibly result in the pump being switched off too late and/or too early.

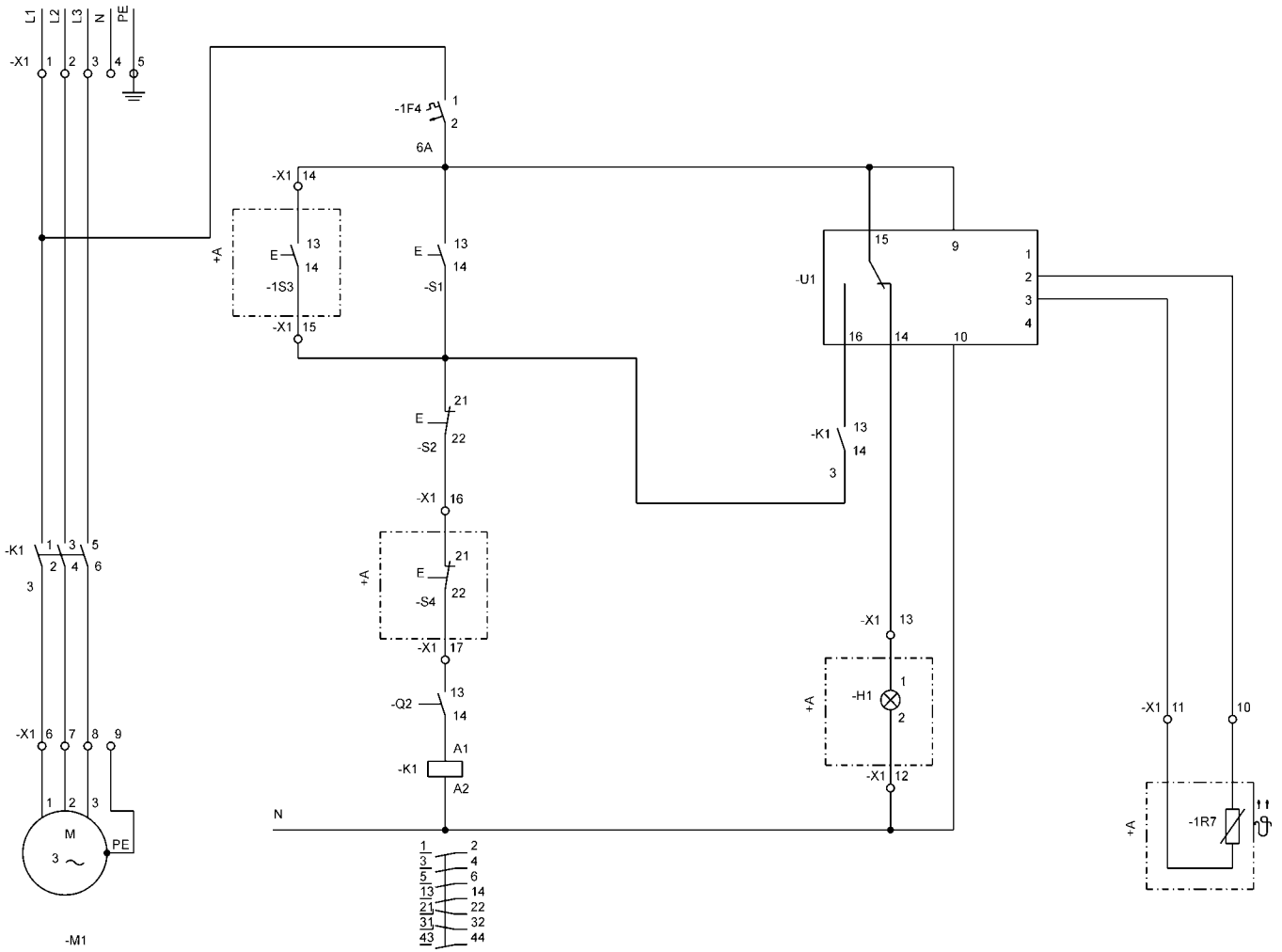


Figure 10:  
Example of ATLS-T1 circuit diagram



Subject to technical alterations

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