DEIF A/S

Rudder transmitter

Type RT-1

4921250020C

- *Analogue output for direct connection of one or more rudder indicators*
- *Output signal selectable: -1…0…1 or 0.1…0.6…1.1mA DC*
- *Electrical adjustment for min. and max. output signal*
- *Operating angle adjustable within the range ±30°...±60°*
- *Protection to IP66*

CE

Application

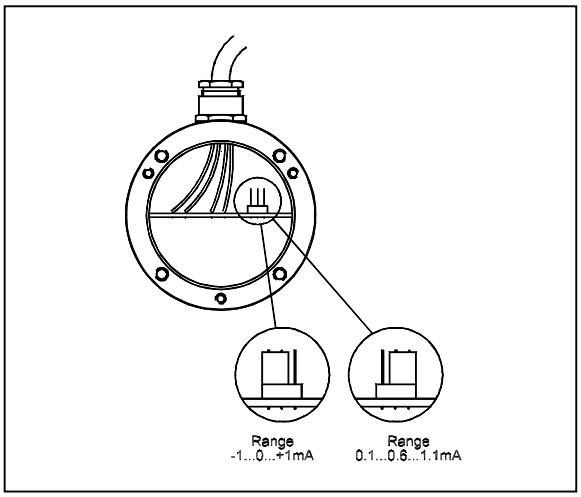
RT-1 is an electronic position indicator applied as a rudder transmitter for marine installations. RT-1 is CE classified for marine, residential, commercial and light industry plus industrial environment.

RT-1 gives a load independent current signal, proportional to the actual rudder position. The output signal has two options: 1..0..1mA or 0.1..0.6..1.1mA DC (live zero). These may be chosen for direct connection to one or more rudder indicators.

RT-1 is housed in a robust housing made from seawater-proof materials. Using an accompanying fixing flange this unit may be mounted at the top or the bottom. RT-1 is furthermore equipped with a removable sector arm which may be connected direct to the transfer mechanism of the rudder stock.

Selection of output signal

RT-1 is as standard delivered with output signal -1..0..1mA DC. Selection of other output signal may be made by means of an internal jumper as follows:



a. Dismantle the bottom plate of the rudder transmitter.

b. Set jumper to position corresponding to requested output signal.

c. Refit and tighten the bottom plate.

Note: The top plate of the rudder transmitter is sealed at the factory and should NOT be dismantled.

The ouput signal (I_{out}) of the rudder transmitter reflects the movements of the sector arm as follows:

Sector arm centred	I_{out}	= 0mA	(0.6mA)
Sector arm is turned clockwise	I_{out}	→ +1mA	(1.1mA)
Sector arm is turned counterclockwise	I_{out}	→ -1mA	(0.1mA)

Values stated in parentheses refer to output signal: 0.1...0.6...1.1mA.

Mounting and adjustment

a. Fasten rudder transmitter to a solid surface by means of fixing flange and 3 bolts.

b. Loosen sector arm of rudder transmitter.

c. Turn rudder to midship position.

d. Turn sector arm and fasten this to transfer mechanism of rudder stock.

e. Connect auxiliary voltage and rudder indicator(s).

f. Turn shaft of rudder transmitter until connected instruments indicate "0".

g. Fasten sector arm to shaft of rudder tranmitter.

h. Check that margin between end-stops of the rudder transmitter is adequate when the helm is put hard over.

i. Remove screws in top plate covering adjustments marked "Z" and "R".

j. Turn rudder to absolute midship position.

k. Adjust MIN. screw marked "Z" until connected instruments indicate "0".

l. Turn rudder to max. starboard position (turn sector arm clockwise).

m. Adjust MAX. screw marked "R" until connected instruments indicate actual rudder angle.

n. Check indication of instruments when helm is in port, starboard and midship position.

o. Refit and tighten screws covering the two adjustment screws, "R" and "Z".

Transfer mechanism

If output signal 0.1..0.6..1.1mA is selected, the transfer mechanism from the rudder stock to the sector arm should be designed to ensure that when the rudder is turned to starboard position, the sector arm of the rudder transmitter is turned clockwise.

If output signal -1..0..1mA is selected, a transfer mechanism ensuring that the sector arm of the rudder transmitter turns clockwise or counterclockwise when the rudder is turned to starboard position, may be applied. If the sector arm is turned counterclockwise when the rudder is turned to starboard position, the output signal of the rudder transmitter should be connected with opposite polarity to the connected rudder indicators.

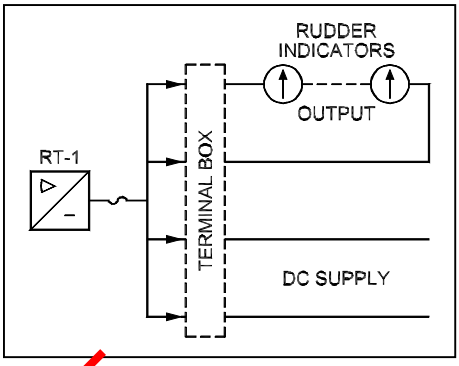
Top mounting

RT-1 is as standard delivered with fixing flange mounted for bottom mounting. If top mounting is requested, the sector arm is removed and the fixing flange is mounted on the top of the housing by means of the 4 screws provided.

Connection

RT-1 is supplied with a fixed marine cable, designed for connection to an external connection box. The cable is provided with 4 wires for connection of auxiliary voltage and output signal respectively.

The rudder transmitter is protected against reverse polarity of auxiliary voltage.

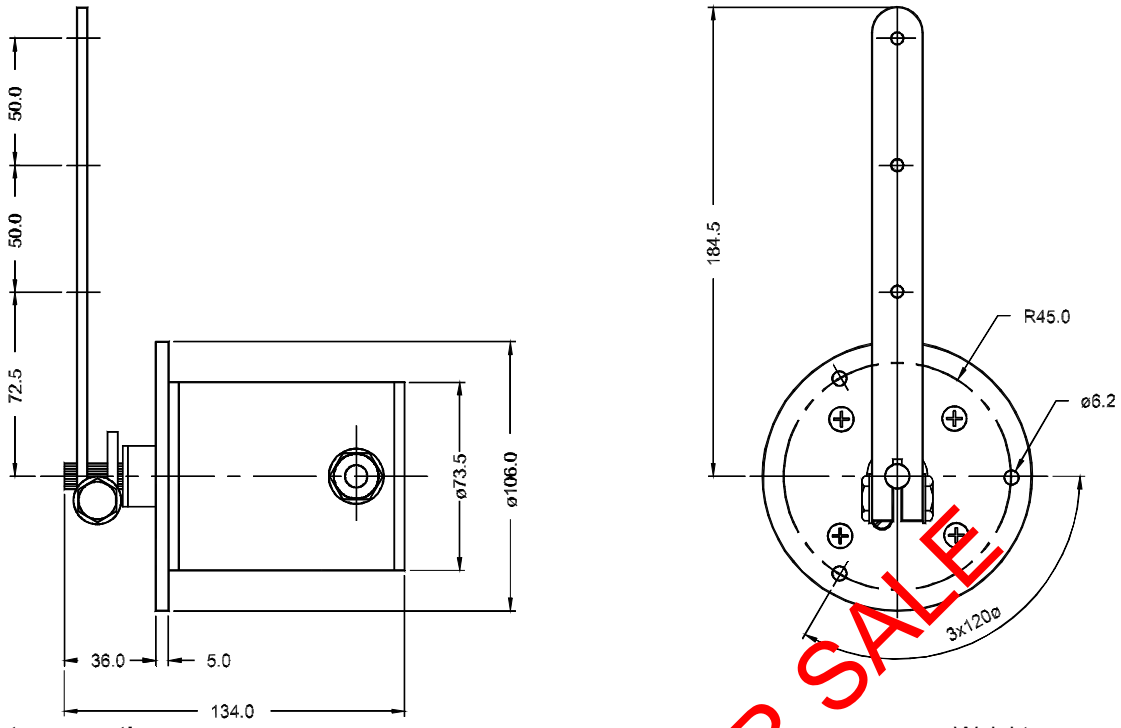


Technical specifications

Operating angle	Adjustable within the range ±30°...±60° (screw marked "R").
Mechanical travel	Max. ±75°.
Analogue output	Protected against short-circuited/open output.
- Standard ranges	I_{out}: -1...0...1mA or 0.1...0.6...1.1mA DC.
- Load	R_{Lmax}: 5kΩ (-1...0...1mA), 4.5kΩ (0.1...0.6...1.1mA).
- Reproduceability	Better than ±0.5% of $I_{out\,max.}$
- Load dependence	Max. 0.05% for $R_{Lmin-max.}$
- Temperature drift	Max. 0.2% of $I_{out\,max.}$ per 10°C.
- Voltage drift	Max. 0.2% of $I_{out\,max.}$ at U_{aux}: 18...60V DC.
- Min. adjustment	Adjustable within the range ±25% of $I_{out\,max.}$ (screw marked "Z").
Auxiliary voltage	(U_{aux}): 18...60V DC. Consumption: approx. 15mA.
- Ripple voltage	Max. 10%$_{p-p}$ of U_{aux} within the range 18...60V DC.
- Ripple frequency	40...130Hz.
Insulation	Between housing and connections: >10MΩ at 500V DC. No galvanic separation between auxiliary voltage and output signal.
High-voltage test	1kV - 50Hz - 1 min. between housing and connections.
Temperature	-10...55°C (nominal). -25...70°C (operating). -40...70°C (storage).
Climate	Class HSE, to DIN 40040.
Vibrations	To DNV: Class B.
Shock test	6 attempts with 15g in 3 directions to IEC 68-2-27, Test: Ea.
EMC	To EN 50081-1/2, EN 50082-1/2, SS4361503 (PL4) and IEC 255-4 (class 3).
Connections	1.5m marine cable with 4 wires for connection of auxiliary voltage and output signal. Wire dimensions: 0.5 mm^2 (multi-stranded).
Materials	Plastic: Self-extinguishing to UL94 (V0). Metal parts: Seawater-proof bronze/SFR materials.
Protection	IP66 to IEC 529 and EN 60529.

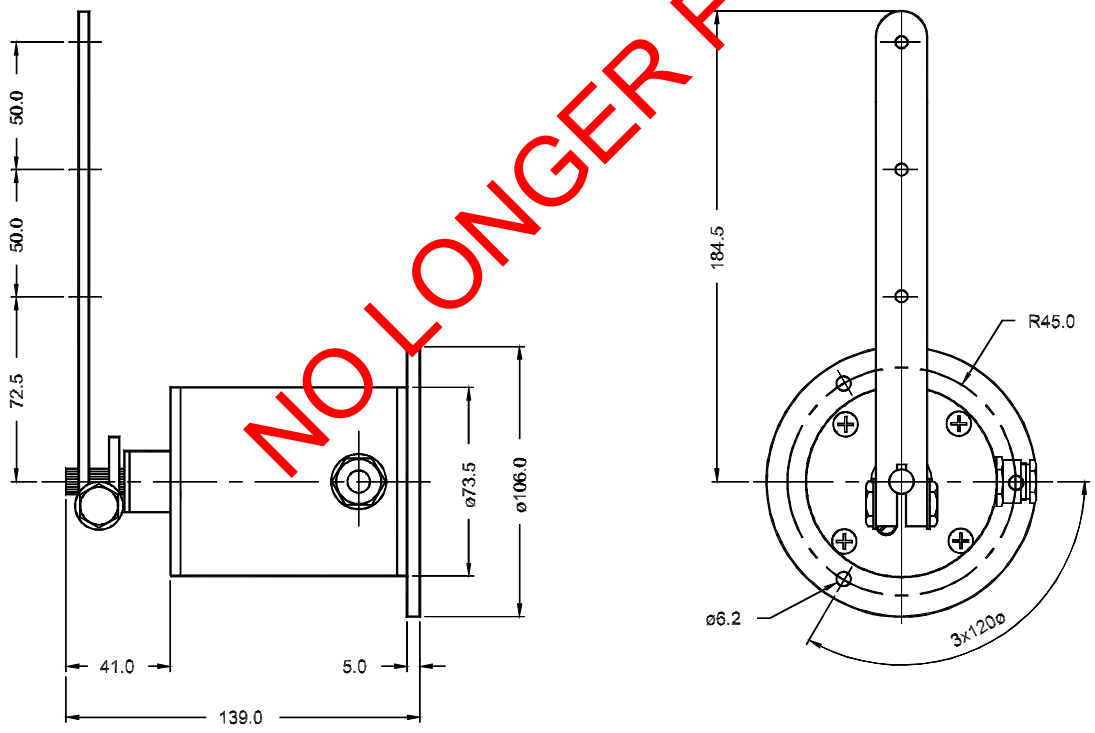
Dimensions

All dimensions in mm



RT-1 for top mounting Weight: approx. 2.5 kg

All dimensions in mm



RT-1 for bottom mounting Weight: approx. 2.5 kg

Order specifications

Type

Errors and changes excepted.

DEIF A/S, Frisenborgvej 33
DK-7800 Skive, Denmark

Tel.: +45 9614 9614, Fax: +45 9614 9615
E-mail: deif@deif.com, URL: www.deif.com