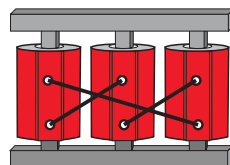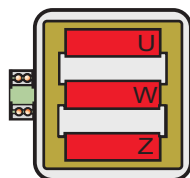# PROGRAMMABLE THERMAL OVERLOAD PROTECTION

Very wide supply range

INSULATED INPUTS

DAL 4

FOR: TRANSFORMERS, MOTORS, ALTERNATORS, CONVERTERS, INVERTERS, POWER UNITS, ELECTRIC BOARDS ETC...
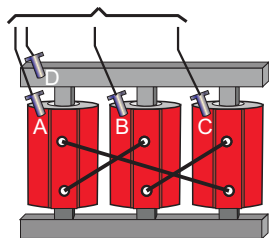
Operation

Under routine operating conditions DAL 4 reads the probe temperature values, compares them with the relative adjustment and alarm set points, activates the command outputs for adjusting and protecting the electrical machine. The display visualizes the probe with the highest temperature value and the programmed set-point with the acronym of the output that will be activated if the read temperature exceeds the set-point value. The LEDs indicate the status both of the commanded outputs and any self-held alarms.
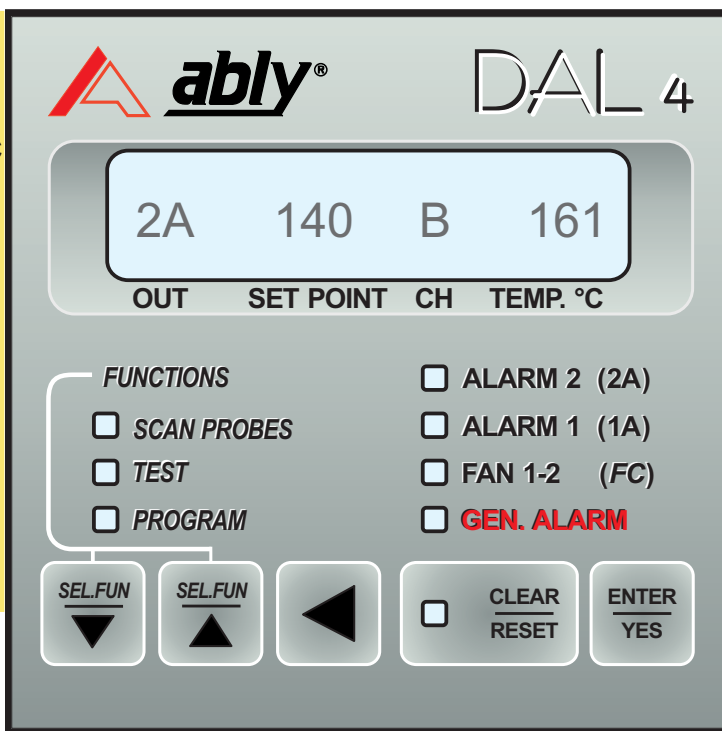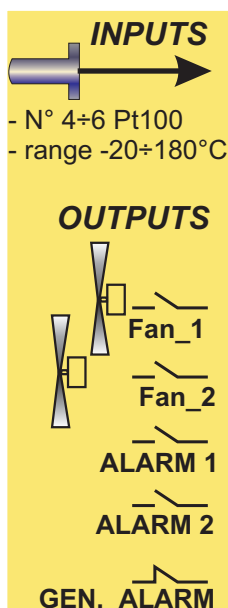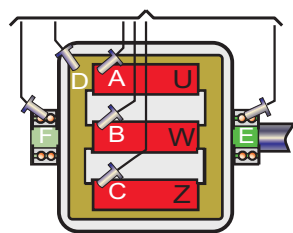
User interface

The front panel is equipped with a:
- 16 characters backlight alphanumeric LCD,
- 8 warning LEDs and 5 buttons.

The user sees all the functional status of the controlled machine on the front panel, programs the adjustment, runs tests on the command outputs and may re-define the display mode.
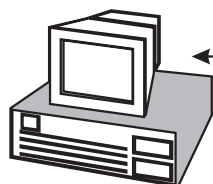
DAL 4 adjusts the cooling of the electrical machine and protects it from thermal overloads.

INPUTS
- N° 4÷6 Pt100
- range -20÷180°C

OUTPUTS
Fan_1
Fan_2
ALARM 1
ALARM 2
GEN._ALARM

Serial I/O
-RS-232
-RS-485

Analog Output 4÷20 mA

| 2A | 140 | B | 161 |

OUT   SET POINT   CH   TEMP. °C

FUNCTIONS
- [ ] SCAN PROBES
- [ ] TEST
- [ ] PROGRAM

- [ ] ALARM 2 (2A)
- [ ] ALARM 1 (1A)
- [ ] FAN 1-2 (*FC*)
- [ ] GEN. ALARM

SEL.FUN ▼   SEL.FUN ▲   ◄   [ ] CLEAR RESET   ENTER YES

It **stores** the each maximum attained temperature probes value

DAL 4 may be remotely controlled by supervision systems or by PLC via serial I/O or analog

PLC

Supply Voltage 20Vdc to 260Vac

DAL 4 facilitates the design of the electrical machine's control panel thanks to its extensive power supply voltage range.

PRESENTATION

DAL 4 is the controller designed for satisfying the increasing demands of electrical machine users and installers.

DAL 4 assists the operator in programming the adjustment and alarm parameters by means of the front panel. The alphanumeric display guides the operator during the programming stages.

All DAL 4 circuits are galvanically isolated

DAL 4 diagnoses faults and alarms for increasing reliability in managing the cooling and protection functions of the electrical machine.

PERFORMANCE

Programming

The programming of the parameters (adjustment, alarms, special outputs activation/deactivation specifications) is simplified by a standard program that poses explicit questions to the user via the display, checks the consistency of the user's answers and, in case of errors, warns the user at once by means of alphanumeric messages.
For each probe the following data may be defined during the programming stage: if it is present, if it has been acquired for reading purposes only and if, in addition to being acquired, it contributes to the adjustment.

Safeties

DAL 4 constantly runs the self-diagnosis of the internal components and the connected probes.
If malfunctions occur, the fault or breakdown is signaled on the display, by means of a message, and remotely by the deactivation of the general alarm relay.
Malfunctions are managed by the adjustment, based on their seriousness, as fault or breakdown.
If it is a BREAKDOWN, i.e. when a condition occurs that prevents the adjustment and the protection of the electrical machine, all outputs are deactivated.

Electrical specification:

Supply voltage : from 24 Vdc to 240 Vdc; from 24 Vac to 240 Vac, 50-60 Hz; **Tolerance:** +10%, -15% of rated value
Absorption: 6 VA
Running temp.: from 0° to 50°C, %R.H. max 90% non condensing ; **Storage temp.:** from -20° to +80°C
Inputs: n° 4/6 RTD PT100 din 43760 with internal compensation for line resistence up to 10 Ohm, insulation 1500 V
Range: from -20° to 180°C; **Risolution:** 1°C ; **Precision:** 0,5% F.S. 1 digit
Outputs: n°4÷5 relays, 4 SPDT, 5A at 230Vac @ cos-fi=1
Terminal boards: for cables measuring up to 1,5 mmq.
Manufactoring: Self-extinguishing ABS container, front panel made of unscratchable polycarbonate IP54, fixed to panel with screw brackets
Dimensions: compliant to DIN 43700 96x96 P 110 (mm)

Ordering Codes

(Complete the squares x, E with the required options)

801G x 0 0 E = DAL 4 4 in, 4 out Spdt
801G x 0 1 E = DAL 4 6 in, 5 out (3 Spdt)

x _____	**[T] Treatment**
0 _____	No
T _____	Tropicalization

E____	**[E] Expansions**
0 ___	No
1 ___	Interface RS-485
2 ___	Interface RS 232
3 ___	Output 4÷20 mA
4 ___	Output 4÷20 mA + RS 485
5 ___	Output 4÷20 mA + RS 232

Accessory
Code 16450001 : Mask for increasing protection to IP65

Device configuration:

DAL4 4 inputs PT100 code: 801G0000
It reads 4 imputs PT100, commands 4 relay SPDT outputs with: ventilation, pre-alarm, release and general alarm functions. *Typical application*: *Transformers*

DAL4 6 inputs PT100 code: 801G0010
It reads 6 imputs PT100, commands 5 relay outputs with: 2 speed ventilation, pre-alarm, release and general alarm functions.*Typical application*: *motors, alternators*

Optionals
- Module for serial connection type RS-232, RS-485 for protocol MODBUS _RTU (MODBUS is a MODICON mark). - Module with analogical output associated to the highest measured temperature.
- Mask for increasing protection to IP65
- Tropicalization treatment

- PT100 probes (100 ohm at 0 °C) with various kinds of insulation and dimentions (fiberglass bar execution model SRPE, cilindrical execution model SRN).

DAL-4_ENG_REV_C