EXOcompact

Freely programmable controller

A small and compact controller in three different I/O sizes and with different kinds of communication, with or without internal display. EXOcompact can be used as a stand-alone unit or as part of a system.

- **Freely programmable controller with fixed I/O configuration**
- **For controlling heating centrals, ventilators etc.**
- **8, 15 or 28 I/Os, with or without internal display. External display as option for models without internal display.**

- **Complement to EXOflex in large automation systems**
- **Communication via RS485 (EXOline, Modbus) or dial-up connection (phone or GSM dial-up), TCP/IP or LON**
- **Programming using EXOdesigner**

EXOcompact is a range of freely programmable controllers in three different I/O sizes, with or without internal display. EXOcompact has a fixed I/O configuration with 8, 15 or 28 I/Os. It is completely compatible with other EXO products.

EXOcompact is freely programmable in EXOL®, the EXO high-level language. The programming is done using EXOdesigner, the same development environment as for all other EXO controllers.

EXOcompact has a galvanically isolated communication port for reliable communication and a real-time clock (RTC) for precise time control.

Application areas

EXOcompact is primarily used in applications where the number of I/Os is limited, where it is important to have a controller that is freely programmable, compact, with communication possibilities and high performance. EXOcompact can be used either as a stand-alone unit, or as part of an automation system together with other EXO products.

EXOcompact is an excellent complement to EXOflex in large automation systems and is well-suited for localised tasks, such as zone control or control of heating centrals and ventilators.

Installation

EXOcompact can be mounted either on a DIN rail or, with an additional mounting kit, in a panel front. The form factor of the casing is EURO norm, which means that it fits into a standard EURO norm cabinet.

Models

The EXOcompact range consists of 18 different models with or without internal display and with different I/O configuration. For models without internal display, there are external display units available as option. There are models with TCP/IP or LON port.

Front mounting kits

FMCE and EK216 are two front mounting kits that can be used for EXOcompact.

FMCE has protection class IP40 and makes it easier to mount EXOcompact in a front panel etc.

EK216 is a plastic casing with a transparent lid and protection class IP65. It can be used for DIN rail mounting. EK216 is 216 mm in width.

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Displays

Internal display

The display for models with internal display is backlit and has 4 rows with 20 characters per row. The lighting is normally off, but it is activated when a button is pressed. The lighting is automatically turned off after a period of inactivity.

There are two indications on the front:

- The alarm indication is marked with a 🔔 symbol
- The write indication is marked with a ✏ symbol

The menu system is controlled via seven buttons:
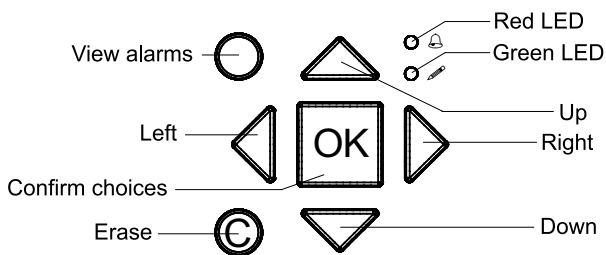
For more information on how to use the internal display on EXOcompact, see document M2166, EXO-Displays.

External displays

For installations that require an external display (HMI), EXOcompact is prepared for fast connection to the independent display and configuration units ED9200, ED9100 and E-DSP.

ED9200

ED9200 can be used for EXOflex, Corrigo E and EXOcompact. The unit can be mounted in a panel or similar. There are two approved connection cables, 3 or 10 m length, to order as accessories. EXOcompact has an RJ12 modular jack for fast connection to ED9200.

ED9100 and E-DSP

ED9100 and E-DSP are alternatives to ED9200. They are intended to be used with EXOcompact or Corrigo E. The units are delivered including cables. ED9100-3 and E-DSP-3 are delivered with a 3 m cable, ED9100-10 and E-DSP-10 are delivered with a 10 m cable. EXOcompact has an RJ12 modular jack for fast connection to ED9100 or E-DSP.

ED9100 can be mounted in a panel or similar, E-DSP can be mounted directly on a wall or on a device box (cc 60 mm).

For more information on ED9200, ED9100 and E-DSP, see data sheets 0-930, 3-910 and 3-900.

Communication

EXOcompact can communicate via RS485 (EXOline, Modbus) or dial-up connection (phone or GSM dial-up), LON or TCP/IP.

Models with LON port

The LON port functions as a gateway between EXO and the LON network. It is based on the FT 3150 Smart Tranceiver from Echelon (two-wire connection).

A suitable LonMark function profile is selected from the EXOdesigner library to match the external LON equipment function profile. The connection between the SNVT:s of the function profile and the corresponding EXOL variables is predefined in a so-called .dpe file that is downloaded via the EXOline port.

The selected function profile is loaded from the LON network with LonMaker. The accompanying variable description file (.xif file) should also be loaded.

A maximum of 62 SNVT:s can be handled in the predefined function profiles.

Function profiles

There are a number of fixed configuration files implemented.

The available profiles are:

- Fan Coil Controller, 8020-11
- VAV Controller, 8010-11
- Boiler Controller, 8301-10
- Roof Top Unit Controller, 8030-11
- Chiller, 8040-10
- Thermostat, 8060-10
- Damper Actuator, 8110-11
- Chilled Ceiling Controller, 8070-10
- General EXOcompact specific I/O profile to mirror inputs and outputs
- Utility Meter

Note that the Utility Meter profile does not mirror the nciLocation to EXOcompact, but is only found on the LON side.

For more information on the function profiles, see the LonMark homepage, http://www.lonmark.org.

Models with TCP/IP port

The TCP/IP port offers you an easy way to reach a larger geographical area with your systems. You can also use an existing infrastructure with networks for regular computers, and thereby reduce the installation cost.

EXOcompact can be connected to all kinds of TCP/IP networks, for example local networks, the Internet etc. However, EXOcompact should not be connected to dial-up connected TCP/IP networks. Certain built-in safety functions make it possible to use EXOcompact over the Internet. The use of a firewall is recommended.

Configuration, commissioning and maintenance can be performed in EXOdesigner. For information about configuration etc., see the EXO System Manual. For indications, see the table for TCP/IP below.

Models with TCP/IP port have a gateway that handles EXOline messages over TCP/IP networks and translates the communication to traditional serial communication. In EXOcompact, Port 1 is replaced by the TCP/IP port, which means that EXOcompact can only function as a Slave. For TCP/IP Master function outside the main computer, use EXOflex.

The additional protocol handling over TCP and IP means that there is a delay compared with a cable connection between two controllers. However, by running controllers in parallel directly from the main computer, you can achieve very high performance.

Modem connection

Regin has different kinds of external modems for connection to Port 1.

Software requirements for modems

EXOreal 2.8-1-31 and EXO 2005.

Indications

Status indication can be found in the upper left corner of the controller. For controllers with display, the alarm indication and write indication are located on the front.

LON

Designation	Colour	Description
P/B	Green/Red	Power on/Battery error
Lan/Serv	Yellow	Flashing: service (unbound) Fixed: service pin pushed in
Rx	Green	Port 1, receiving
Tx	Green	Port 1, transmitting

TCP/IP

Designation	Colour	Description
P/B	Green/Red	Power on/Battery error
Lan/Serv	Green/Yellow	Fixed green: Link Flashing green: traffic Flashing yellow: identification
Rx	Green	Port 1, receiving
Tx	Green	Port 1, transmitting

Connections

Here are general connection diagrams for EXOcompact.
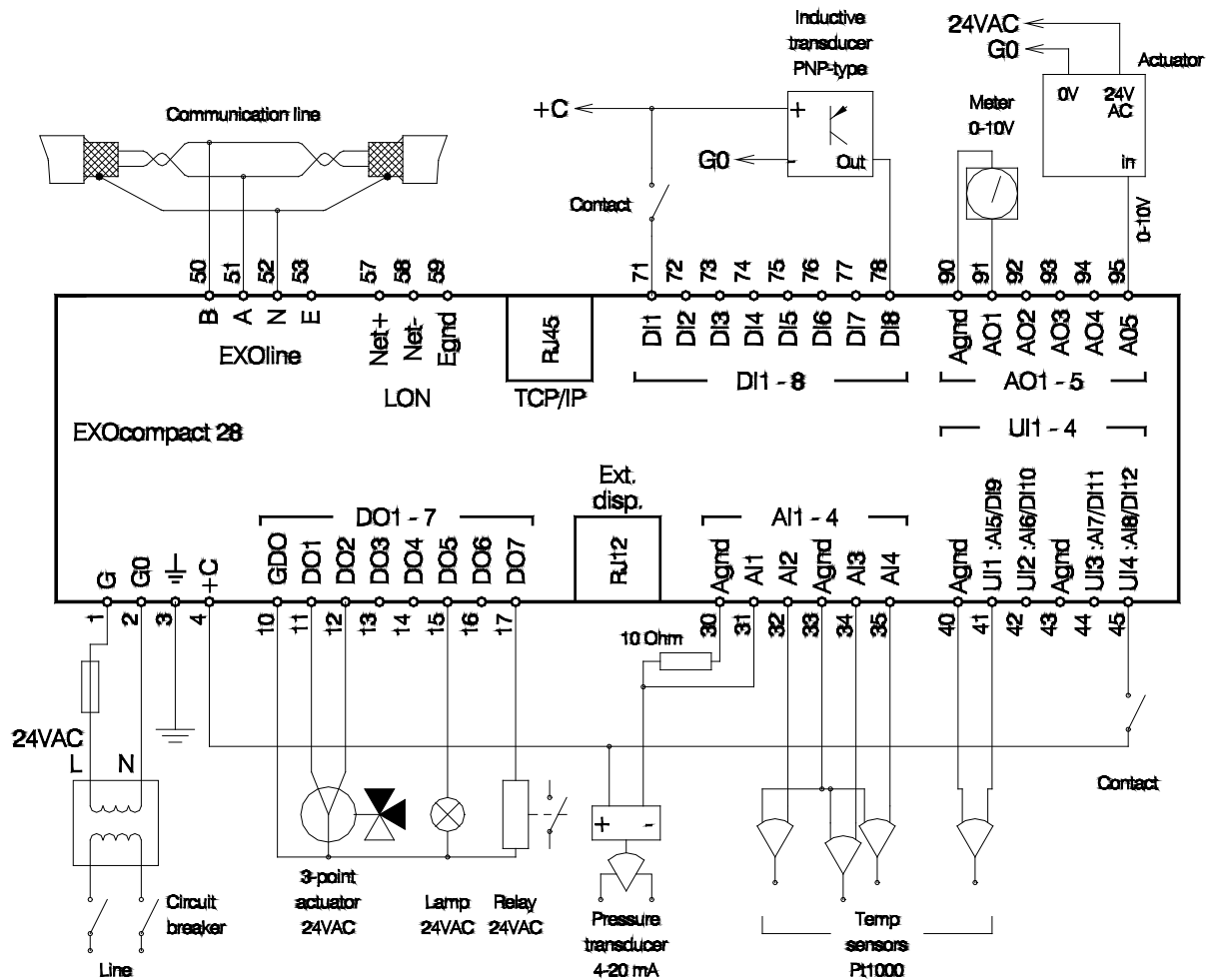
Connections for EXOcompact 8

1	G	Supply voltage 24 V AC, ±15%. 50…60 Hz
2	G0	
3		Protective earth
4	+C	+24 V DC, reference for digital inputs DI
10	GDO	Reference for digital outputs DO
11	DO1	
12	DO2	
RJ12		Connection for external display (only for models without internal display)
30	Agnd	Reference pole for analog inputs AI
31	AI1	
32	AI2	
50	B	Port 1, EXOline connection, Modbus, External modem
51	A	
52	N	
53	E	
57	Net +	LON connection (only LON models)
58	Net -	
59	Egnd	
RJ45		TCP/IP connection (replaces Port 1, only TCP/IP models)
71	DI1	
72	DI2	
73	DI3	
90	Agnd	Reference pole for analog outputs AO
91	AO1	

Connections for EXOcompact 15

1	G	Supply voltage 24 V AC, ±15%. 50…60 Hz
2	G0	
3		Protective earth
4	+C	+24 V DC, reference for digital inputs DI
10	GDO	Reference for digital outputs DO
11	DO1	
12	DO2	
13	DO3	
14	DO4	
RJ12		Connection for external display (only for models without internal display)
30	Agnd	Reference pole for analog inputs AI
31	AI1	
32	AI2	
33	Agnd	Reference pole for analog inputs AI
34	AI3	
35	AI4	
50	B	Port 1, EXOline connection, Modbus, External modem
51	A	
52	N	
53	E	
57	Net +	LON connection (only LON models)
58	Net -	
59	Egnd	
RJ45		TCP/IP connection (replaces Port 1, only TCP/IP models)
71	DI1	
72	DI2	
73	DI3	
74	DI4	
90	Agnd	Reference pole for analog outputs AO
91	AO1	
92	AO2	
93	AO3	

Connections for EXOcompact 28

1	G	Supply voltage 24 V AC, ±15%. 50…60 Hz
2	G0	
3		Protective earth
4	+C	+24 V DC, reference for digital inputs DI
10	GDO	Reference for digital outputs DO
11	DO1	
12	DO2	
13	DO3	
14	DO4	
15	DO5	
16	DO6	
17	DO7	
RJ12		Connection for external display (only for models without internal display)
30	Agnd	Reference pole for analog inputs AI
31	AI1	
32	AI2	
33	Agnd	Reference pole for analog inputs AI
34	AI3	
35	AI4	
40	Agnd	Reference pole for universal inputs UI
41	UI1: AI5	
42	UI2: AI6/DI10	
43	Agnd	Reference pole for universal inputs UI
44	UI3: AI7/DI11	
45	UI4: AI8/DI12	
50	B	Port 1, EXOline connection, Modbus, External modem
51	A	
52	N	
53	E	
57	Net +	LON connection (only LON models)
58	Net -	
59	Egnd	
RJ45		TCP/IP connection (replaces Port 1, only TCP/IP models)
71	DI1	
72	DI2	
73	DI3	
74	DI4	
75	DI5	
76	DI6	
77	DI7	
78	DI8	
90	Agnd	Reference pole for analog outputs AO
91	AO1	
92	AO2	
93	AO3	
94	AO4	
95	AO5	

Connection example, EXOcompact 28 I/Os

Models

EXOcompact...			
Number of inputs and outputs (I/Os)*	Models with 8 I/Os 2 AI, 3 DI, 1 AO, 2 DO	Models with 15 I/Os 4 AI, 4 DI, 3 AO, 4 DO	Models with 28 I/Os 4 AI, 8 DI, 5 AO, 7 DO, 4 UI
Basic model	C80	C150	C280
Basic model with display	C80D	C150D	C280D
Model with LON port	C80L	C150L	C280L
Model with LON port and display	C80DL	C150DL	C280DL
Model with TCP/IP port	C80T	C150T	C280T
Model with TCP/IP port and display	C80DT	C150DT	C280DT

External displays	
E-DSP-3	Delivered with 3 m connection cable
E-DSP-10	Delivered with 10 m connection cable
ED9200	Two cables, EK12 (3 m) and EK14 (10 m) are available as accessories. See datasheet 0-930 (ED9200) for more information.
ED9100-3	Delivered with 3 m connection cable
ED9100-10	Delivered with 10 m connection cable

Front mounting kits for EXOcompact
FMCE
EK216

Technical data

Common data

Supply voltage	24 V AC +/- 15%, 50...60 Hz
Power requirement	3 VA (without load, without display)
+C output	+ 24 V DC, 0.1 A, short-circuit proof
Communication	EXOline, Modbus or dial-up connection Port 1, isolated, via a built-in RS485 connector. Modems are available as accessories for Port 1. There are models with TCP/IP or LON port.
Operating system	EXOreal
Battery backup	Memory and real-time clock, at least 5 years
Ambient temperature	0...50°C
Dimensions	148 x 123 x 58 mm (W x H x D). DIN controller width: 8 1/2.
Protection class	IP20
Mounting	DIN rail mounting or cabinet mounting
CE	This product conforms with the requirements of European EMC standards CENELEC EN61000-6-1 and EN61000-6-3 and carries the CE mark.

Inputs

Analog inputs, AI	0...10 V, 0...200 mV, Pt1000, DIN Ni1000, LGNi1000, 12 bit A/D
Digital inputs, DI	Floating contact, 24 V DC, configurable for pulse input
Universal inputs, UI	AI or DI (see above)

Outputs

Analog outputs, AO	0...10 V, 5 mA, 8 bit D/A, short-circuit proof
Digital outputs, DO	Triac output 24 V AC, 0.5 A contact, configurable for pulse output

Data for models with internal display

Display	LCD, backlit, 4 rows with 20 characters, international character set
Power requirement	+ 1 VA in addition to the basic requirement

Data for models with LON port

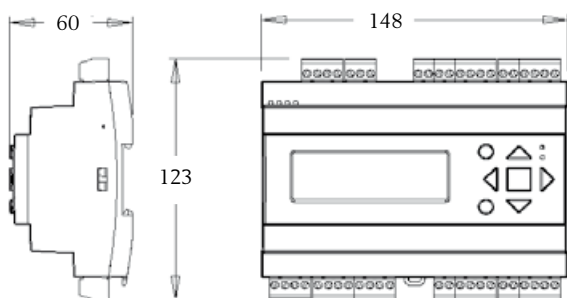|	
Connection	78 kbps FT 3150 Smart Transceiver, for two-wire cable
Cable length	max depends on bus topology and cable type, see http://www.echelon.com
Power requirement	+ 2,5 VA in addition to the basic requirement
Port 1	Yes

Data for models with TCP/IP port

Connection	10Base-T/100Base-TX auto-negotiation (RJ45).
Cable length	max 100 m (min Cat 5)
Protocol	EXOline-TCP
Power requirement	+ 2,5 VA in addition to the basic requirement
Port 1	No

Accessories for Port 1

GSM modem	Yes. Requires a suitable RS232 to RS485 converter and a null modem adapter.
Dial-up modem	Yes.
	The modems should be ordered from Regin for proper settings.
	For more infomation on EXOcompact accessories, see document M2160, Accessories to EXO.

Dimensions

Measurements in mm.

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