Ability projects ltd

Verger et Delporte UAE Ltd

INDEX

1. Compliance Statement

PROJECT: MASDAR INSTITUTE OF SCIENCE AND TECHNOLOGY
MAIN CONTRACTOR: MEP STS ABU DHABI
SYSTEM: FAN COIL UNITS

SPECIFICATION COMPLIANCE STATEMENT

SL.NO	CONTRACT SPECIFICATION	CONTRACTOR'S COMPLIANCE STATEMENT	REMARKS
	GENERAL		
1.1	**Work Included**		
1.1.1	Work of this Section include all labor, materials, Equipment and services necessary to complete the water side control type to complete the water side control type 2-pipe (cooling only) fan coil units and 4-pipe fan coil units (cooling and heating) as shown on the drawings and specified herein, including, but not limited to, the following:	Comply	
1.1.1.1	Provide 2-pipe fan coil units of type, size and duty shown on the drawings and schedules.	Comply	

1.2	RELATED WORK SPECIFIED IN OTHER SECTIONS		
1.2.1	Electric Motors Section 15862	Comply	
1.2.2	Electric Motor Starters Section 15863	Comply	
1.2.3	Sound Control Section 15875	Comply	
1.2.4	Vibration Control Section 15876	Comply	
1.2.5	Building management Control System Section 15905	Comply	
1.3	SUBMITTALS		
1.3.1	Shop Drawings:		
1.3.1.1	Fan coils units dimensional installation details, quantites, capacities and construction. Units must meet all dimensional restrictions shown on drawings.	Comply	
1.3.2	Product Data:		
1.3.2.1	Manufacturer's latest published data for materials, equipment and installation.	Comply	
1.3.2.2	Performance data including entrainment ability, temperatures, Velocities, throw, certified noise	Comply	

	criteria ratings, external pressure available, water coil pressure drop.		
2.1	**Products**		
	Approved Manufacturers		
2.1.1	Refer to approved manufacturers list in Appendix.	Comply	
2.2	**Fan Coil Units**		
2.2.1	Provide 2 pipe waterside control fan coil units suitable for water side control of the type, size and capacity shown on the Drawings and Schedules.	Comply	
2.2.2	The units shall be complete with chassis type, fan motor, motor starter, water coils, as indicated on the schedule on the Drawings, insulated extended auxiliary drain pan, and filters, suitable for installation above suspended ceilings, etc.	Comply	
2.2.3	Construct the unit cabinet of 1.8 galvanized steel sheet. The removable fan board and drain pan assembly shall be formed from a single piece of metal without joints. Exterior surface of galvanized steel drain pan shall be insulated with 15mm minimum insulation. The cabinet	Comply	

	shall be of galvanized steel of aluminum construction		
2.2.4	Water coils shall be constructed of 15mm OD copper tubes mechanically expanded into aluminum fins. The number of fins per meter shall not exceed 500. Water velocity shall not exceed 1.0m/s and air face velocity shall not exceed 2.0 m/s. coils shall be pressure tested to a minimum of twice the working pressure. Furnish manual air vent and drain cocks. The air pressure drop of each coil at full duty shall not exceed 200pa.	Comply	
2.2.5	The fan coil units shall incorporate energy saving EC/DC type motors including harmonic filters where necessary.	Comply	
2.2.6	Motors shall be EC/DC totally enclosed, external type rotar. Bearings are sealed for life ball race type with a manufacturer's minimum life expectancy of 50,000 hours under typical operating conditions. Overload protection is afforded to each individual motor by an auto resetting thermal contactor. Motor insulation is to class 'B' with the enclosure to IP 44. Supply	Comply	

	230V, 1ph, 50 Hz, the fan and motor shall be readily removable and provided with a quick disconnect of the motor cord. Motor frame shall be fitted with maintenance free sealed-for-life sleeve bearings. Speed control is manual infinite adjustable potentiometer, or via 0-10v signal from the BMS.		
2.2.7	Provide local isolator for electrical supply connection within unit mounted junction box. All electronic wiring between fan motor and unit mounted Junction box shall be done by the fan coil manufacturer. Provide quick disconnects for easy removal of fan section and provide suitable control wiring. Unit junction box shall be factory mounted at the rear of the coil connections side of the unit with cover plate screws readily accessible for service from the intake side of the unit.	Comply	
2.2.8	Recirculating type fan coils units shall generally be of the horizontal concealed type. Units with ducted return air of ventilation air shall be of the horizontal cabinet type house the motor and fan assembly in an insulated sheet metal	Comply	

	enclosure with a bottom access door sufficiently sized for removal of fan and motor assembly as a single unit. All fan coil unit fans shall have a minimum external resistance duty as shown on the drawings and schedule.		
2.2.9	The Fan coil units shall not exceed NR-35 within the living rooms and NR-30 within the Bedrooms. Where two or more units are stalled in an enclosed occupied space each fan shall be rated accordingly.	Comply	
2.2.10	The Fan Coil shall be protected by a replaceable air filter to Euro vent Grade EU 2/3 When tested in accordance with BS EN 779. Filters to be approved by all local authorities.	Comply	
2.2.11	Drain pan to extend under control valves to be insulated and run to fall to the condensate drain outlet when the fan coil unit is installed level. Drain pan to be insulated.	Comply	
2.2.12	The MEP contractor shall be ensuring that the controls are provided by the same manufacturer as the controls installed under the BMCS/controls sub-contract. The MEP contractor shall ensure coordination between	Comply	

	the Fan Coil Unit manufacturer and the BMS sub contactor. The manufacturer shall provide per unit a mounted control voltage transformer, controls to operate independently but also should be able to be integrated with the BMCS system. The control package shall also include valves, 24v (raise/lower) actuators and temperature sensors.		Valves Package are by others.
2.2.13	The manufacturer shall also provide software (or other means) to access and adjust all the control settings without, or in advance of the BMS being in place. These control settings shall include the 'reduced demand setback' and the 'Unoccupied setback' control. The BMS contractor to coordinate with the fan coil manufacturer.	Comply	
2.2.14	The controllers will be capable of reducing the speeds of the fan coil unit fans and therefore the volume from those fans with thermal demand is reduced. The BMS contractor to coordinate with the fan coil manufacturer.	Comply	
2.2.15	The controller shall have the capability to accept a signal form an occupancy sensor (PIR)	comply	

	which will allow the fan coil to go into an 'unoccupied set back' condition. The BMS contractor to coordinate with the fan coil manufacturer.		
2.2.16	All default settings will be predefined and forwarded to the fan coil manufacturer, by the BMS contractor. The fan coil manufacturer will download those predefined settings into the factory fitted controller before dispatch. These instructions will include a fan coil address if necessary. The BMS contractor to coordinate with the fan coil manufacturer.	Comply	
2.2.17	The fan coil controller must include a safety feature to ensure that the minimum cooling off coil temperatures specified are never exceeded.	Comply	
2.2.18	All fan coil units to be supplied with factory fitted intake and discharge plenum boxes with pre-formed spigots as necessary and lined with acoustic lining to achieve the correct noise criteria.	Comply	
2.2.19	Internal lining to the casing is required to be upgraded in recognition of the higher moisture content experienced locally.	Comply	

2.2.20	All fan coil units shall be selected to meet the cooling capacitated and noise levels based on medium fan speed unless otherwise noted.	Comply	
2.2.21	The fan coil unit manufacturer shall include for full mock-up testing for the two of the specified fan coil units. Mock-ups shall include ceiling, ductwork, and supply and return diffusers specific to the project. Tests shall include acoustic analysis, air flow and volume, and volume, cooling capacity verification. All tests shall be witnessed by one representative from the client, Project Manager, Engineer, Contractor and Main Contractor. Include for all travel and accommodation expenses.	Comply	
2.2.22	Provide one set of extra filters.	Comply	
2.2.23	Cover complete Fan Coil Unit with protective PVC sheets during Installation.	Comply	
2.2.24	Duct mounted (Supply and Return) Fire protection thermostats shall be provided as per NFPA 90A wherever applicable.	Noted	MEP Contractor to coordinate with relevant supplier
2.2.25	Provide ech unit at high points with easily accessible manual air vent. If not easily accessible, extend vent to the exterior of	Noted	By MEP Contractor

	cabinet for easy servicing. For fan coil Units provide float operated automatic air vents with stop valve.		
2.2.26	The fan coils will be capable of being air flow balanced electronically.	Comply	
	PART 3 - EXECUTION		
3.1	General	Comply	
3.1.1	Supply air units to destitute the specified quantity of air evenly throughout the occupied zone uniformly, draughtlessly, and noiselessly. Sound levels not to exceed ratings as specified elsewhere.	Comply	
3.1.2	For devices installed in plaster construction. Provide plaster frames for setting by other trades. Coordinate all design and margin construction with architectural requirements.	Noted	MEP Contractor to Arrange
3.1.3	All units to be installed truly horizontal.	Noted	MEP Contractor to Arrange

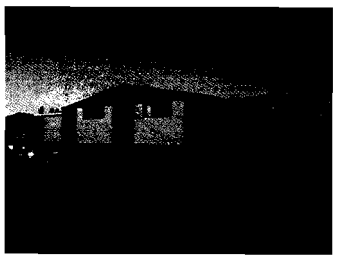
END OF SECTION

2. Company Profile

COMPANY PROFILE

By way of an introduction to Ability, we have pulled together and detailed a number of the more important aspects of the company which we trust you will find of interest.

Ability designs and manufactures a complete range of fan coil units that meet the exacting requirements of UK specifier. A private company, Ability started trading in Jan 2001 but already turns over £6M plus per annum. This equates to 19,000 units a year, nominally 75 per day.



Ability Product Ranges

Titan	Horizontal	Chassis	260mm Deep	
Trojan	Horizontal	Chassis	270mm Deep	Utility Model
Atlas	Horizontal	Chassis	235mm Deep	
Apollo	Horizontal	Chassis	180mm Deep	
Neptune	Vertical	Chassis	235mm Deep	
Neptune	Vertical	Cased	265mm Deep	
Aurora	Horizontal	Chassis	235 or 260 Deep	Hotel Model
Aurora Tallboy	Vertical	Chassis	Special tall slim fan coil mainly used in 'Ultra Quiet' apartment projects	
	Horizontal	Chassis	265 Deep	Airside

EC-DC Motor options for very low running costs and efficiency are available for most of our products.

Sales
The Ability sales team has a great technical expertise, a vast experience of fan coil application and an enthusiasm to configure workable, effective fan coil packages. Your project may be large or small, standard or bespoke but all enquiries receive the same care and attention to detail.

Contract Design
Fan coils sometimes need to be 'Special'. Ability are experts in configuring cost effective and innovative fan coil solutions to meet the requirements of the most exacting building or client.

Innovation

Ability's design department are continually creating and updating our innovative product ranges. A close look will show that many of the features standard in our products are unique. Ability always strives to keep in the forefront of fan coil development bringing you products that keep up with the ever changing needs and demand of your clients and legislation.

Testing

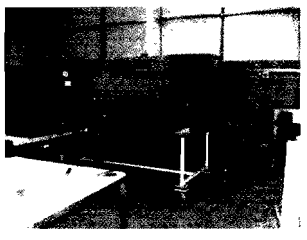
All Ability products are thoroughly performance tested by independent laboratories. These test figures together with our own 'in house' test regimes are your assurance that our products will meet your expectations. Special projects often need special 'witnessed' tests, which we can arrange.

Production Control

Cost effective manufacture, 'On-Time' delivery and quality products are the result of a production facility that is under absolute control. Our production systems ensure that labour is on hand, parts are available and time has been allocated to your project when it is needed.

Production Facility

The Ability factory is a 13,500 sq ft purpose built unit in Wimborne, Dorset. We manufacture our fan coil from raw sheet steel through to the finished item, tested, packed and dispatched. This keeps our lead times short and our prices keen; everything is under our own control.

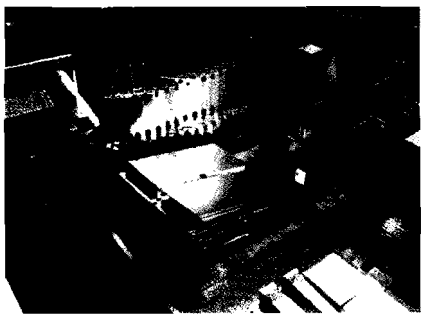


Manufacture

All components are initially drawn. Then integrated software collates all the parts needed for your contract, programs those parts for manufacture and 'nests' the parts into sheets of steel minimising scrap and waste. All this information passes to the machines by wire. Once the metal is processed, several assembly cells complete the assembly process and the fan coils are ready for final test and despatch. Ability manufactures nominally 40 fan coils per day but quantities do rise to 60 when needed.

Service and Maintenance

Ability has it's own service and maintenance team. Not only do they provide support for our own products in the field but they can also service, maintain or overhaul any fan coil installation, from any manufacturer and of any age.



3. Selection of Projects Completed

ABILITY PROJECTS, A SELECTION OF PROJECTS COMPLETED

PROJECT	CLIENT	NO UNITS	VALUE
Vodaphone Warrington	N.G. Bailey	152	£ 55K
Glass House	Parkinson Eng	120	£ 62K
WBC Heathrow	CDS	223	£ 103K
Trafalgar Court Guernsey	Lorne Stewart	303	£ 90K
Europarc Rosyth	Thermal Transfer	210	£ 96k
Summit House	MD Enertech	140	£ 51K
Waterfront	N.G. Bailey	138	£ 52K
Longwalk Rd	Lorne Stewart	121	£ 41K
Microsoft Building 4	Michael J Lonsdale	287	£ 127K
Radisson Hotel Glasgow	ECG	286	£ 106K
Oceana House	EIC Ltd	152	£ 53K
Leicester City FC	Elequip Ltd	134	£ 61K
Aviator Park	Skanska	241	£ 80K
Albion Wharf	Meica Services	606	£220K
Landmark place, Slough	N.G. Bailey	154	£ 54K
Braywick Road	N G Bailey	154	£62K
London Electric	Lorne Stewart	234	£ 72K
Holiday Inn Glasgow	Norstead	286	£ 101K
Optima	ECG	436	£104K
Dell Computers	Skanska	167	£ 61K
Harrods Place	Lorne Stewart	208	£ 106K

ABILITY PROJECTS, A SELECTION OF PROJECTS COMPLETED

PROJECT	CLIENT	NO UNITS	VALUE
Coventry New Hospital	Skanska	121	£ 43K
HQ2 Canary Wharf	Winsor Environ	234	£ 102K
Quayside Development	N G Bailey	437	£132K
Marina View, Guernsey	Lorne Stewart	186	£ 82K
Portsmouth Holiday Inn	Tandy Group	145	£ 38K
Swiss Re	Skanska/Hills	1050	£ 550K
Discovery Dock	Excel	350	£ 94 K
UBS Skye	Bancroft Ltd	768	£ 421K
Sheffield Hallam Hospital	N G Bailey	220	£ 67K
Wandsworth Riverside	Briggs & Forrester	403	£ 104K
Balmoral Hotel	Emcor D & Scull	130	£ 64K
199 Knightsbridge	Axima BS	204	£ 77K
Radisson Hotel Stanstead	Excel A/C	560	£ 212K
Flagship Guernsey	N G bailey	302	£ 98K
Condor House	MJN Colston	288	£ 135K
Palestra	Skanska	756	£ 248K
St George Wharf	Air Cool Eng	131	£ 99K
Project Artisan	Balfour Kilpatrick	234	£ 72K
HBOS Pitreavie	Steill Facilities	206	£ 67K
Riverbank Plaza Hotel	RTT Engineering	462	£ 118K
Gloucester Police	Mitie Eng	182	£ 67K

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CURRENT CONTRACTS – END 2007 ONWARDS

PROJECT	CLIENT	NO UNITS	VALUE
T5 Heathrow	Amec	530	£280K
Cobalt Business Park	N G Bailey	303	£ 106K
Microsoft Reading	FCS Ductwork	297	£ 147K
Ontario Tower	Briggs & Forrester	942	£ 343K
Quatermile Edinburgh	Haden Young	361	£ 158K
Addington St Aparthotel	JS Wright	427	£ 115K
Arora Hotel Heathrow	Crown House	637	£ 143k
Colmore Plaza	Derry B.Services	756	£ 285K
Home Office Sheffield	N G Bailey	310	£ 119K
Uniphar Dublin	Woodleigh Vent	98	£37k
DfES	Mitie/Cofatec	967	£ 310K
Birmingham New Hospital	Haden Young	768	£345K
Union Row Glasgow	N G Bailey	344	£ 168K
Headrow Leeds	Shepherd Eng	398	£ 115K
West Park Shannon	Waterford Winthrop	201	£ 68K
Watermark Place	N G Bailey	969	£427K
Drapers Gardens	N G Bailey	704	£300K
Osnaburgh Regents Place	FCS Ductwork	901	£347K
Calthorpe House	Birchalls	247	£120K

4. Ability Quality Statement

QUALITY POLICY

The company has implemented a Quality System to meet the needs of National and International Quality Systems and Regulatory Requirements.

The Quality System conforms to the requirements of the **BS EN ISO 9001:2000.**

It is the established policy of Ability Projects Limited to provide pre and post sales technical support and quality products, which consistently meet the needs of our customers.

Ability Projects Limited constantly strives for continuous improvements. The company recognises that the development of its employees, and the support from them are critical factors for achieving its objective of consistent service and product quality and ultimately, customer satisfaction.

The company is committed to providing a safe and secure working environment for all its employees ensuring that safe equipment and working practices are in place for all operations carried out within the company's premises.

Commitment to this policy involves every aspect of the company's business and its employees. The policy is implemented by consistent adherence to the processes and systems documented in the Quality Manual, Quality Procedures (AQP's) and Work Instructions.

The Quality Policy and associated quality objectives are established and reviewed within each management review meeting, and are communicated to and understood by all members of the organisation.

5. Matrix Specification

The fan coils will be of the energy saving EC/DC type and include harmonic filters where necessary.

The fan coil units shall capable of being air flow balanced electronically. This requires that each fan within the fan coil units selected shall be matched to a single duct run, grille plenum and grille. Volume control devices are not required and shall not be included. The volume of each fan shall be set by means of a 0 10 Volt DC control signal. This shall be affected by either:

1. Adjustment of individual fan volumes and overall speed control will be a function of manual adjusters mounted to each unit, one per fan with one master speed control.

2. Adjustment of individual fan volumes and overall speed control will be a function accessible through the supplied fan coil terminal controller.

The fan coil controller to be supplied will have the capability to communicate with a Building Management System but should also have the potential to 'Stand Alone'.

The fan coil controller shall be supplied by the fan coil unit manufacturer. The control package will also include valves, 24v (raise/lower) actuators, temperature sensors and a supply transformer if required.

The fan coil unit manufacturer must also provide software (or another means) to access and adjust all the control settings without, or in advance of the Building Management System being in place. These control settings to include the 'Reduced demand setback' and the 'Unoccupied setback' described later.

The controller will have the normal features for controlling the heating and cooling valve modulating action. Set point, dead zone heating and cooling and proportional band heating and cooling.

However, the controller will have the following energy saving features.

The controllers will be capable of reducing the speeds of the fan coil unit fans and therefore the volume from those fans when thermal demand is reduced.

The controller shall have the capability to accept a signal from an occupancy sensor (PIR) which will allow the fan coil unit to go into an 'Unoccupied set back' condition.

Both these energy saving features will adjust the fan speeds of all the fans with each units and will not affect the balance of the fans.

All default settings will be predefined and forwarded to the fan coil manufacturer.

The fan coil manufacturer will download those predefined settings into the factory fitted controller before despatch. These instructions will include a fan coil address if necessary.

The fan coil controller must include a safety feature to ensure that the minimum cooling off coil and the maximum heating off coil temperatures specified are never exceeded.

Chassis panel work is all 'In House' manufactured from nominally 1.2mm Galvanised steel. Where at all possible, flanges are formed inward facing to prevent exposure to bare metal edges. Sufficient forms and folds are incorporated to provide a vibration free, robust structure. The panel work is jointed throughout using 3/16" 'Polygrip' self adjusting and 'air tight' rivets.

condensate tray do not require the removal of any panels. The fan access hooks in place on a front lip and swings closed. This is then retained by machine screws into captive "Nutserts". The coil / condensate tray assembly is retained again by Machine Screws into 'Nutserts'.

Fans are direct drive, double inlet, forward curved centrifugal type. Both the impellors & impellor housings are of galvanised steel. Fan & motor assemblies are mounted separately to the fan deck assembly using M6 Machine screws into captive "Nutserts" and can be removed individually for non routine servicing or replacement. Each fan is connected to the fan wiring loom by terminal strip. Motor & impellor assemblies are statically and dynamically balanced in twin planes.

Motors are EC DC totally enclosed, external rotor type. Bearings are sealed for life ball race type with a manufacturers minimum life expectancy of 50,000 hours under typical operating conditions. Overload protection is afforded to each individual motor by an auto resetting thermal contactor. Motor insulation is to class 'B' with the enclosure to IP44. Supply 230V 1Ph 50Hz.

Speed Control is by manual infinite adjustable potentiometer, or via a 0 10v signal from the BMS.

Coils are manufactured from seamless 3/8" copper tube, mechanically expanded onto aluminium fins. Fins are punched with die formed collars to afford maximum heat transfer surface area with the tubes. All coils are circuited for maximum output and from bottom to top, optimising output and ensuring free venting and draining. Vents and drains are slotted type. Coils are unhanded but not interchangeable. Handing notated against direction of airflow. Coil terminations are 15mm dia' plain copper at 40mm centres through an aluminium support plate for rigidity. Every coil is leak tested using dry air under water to 20 bar. Pressure drop details are given on page 6 of this data sheet.

The Condensate Tray covers the entire coil and valve assembly area and has a positive fall to the 15mm drain point. The pan is manufactured from galvanised steel, corners are brazed and the termination is silver soldered into position. Each pan additionally incorporates a pressure normalising external cover. Stainless steel pans are available as an option.

Insulation is used throughout for both thermal and acoustic damping. Insulation is open cell, class 'O', CFC and HFC free expanded foam. Foam complies with CAA airport and London Borough flammability and toxicity requirements. Adhesive has light, ageing and temperature tolerance.

Spigots as standard, are circular 200mm or 250mm dia. manufactured from galvanised steel. These are screw fixed to the front of the fan coil unit in the positions indicated. Unused spigot connections are capped off but remain available for use if layout changes occur. End spigot connections can be provided on request. Rectangular spigots are also available if requested.

Controls Enclosure All controls are, as standard, fitted to a control back plate which is located on the side of the fan coil. The electrical cover then encloses the controls and gives access from both the side and below. The whole electrical assembly including switches is mounted on the side of the fan coil unit alongside the coil terminations and valve assembly.

Filters are EU2 or EU3 media secured to a wire metal frame, easily removable for routine maintenance, cleaning or replacement. Other types are available.

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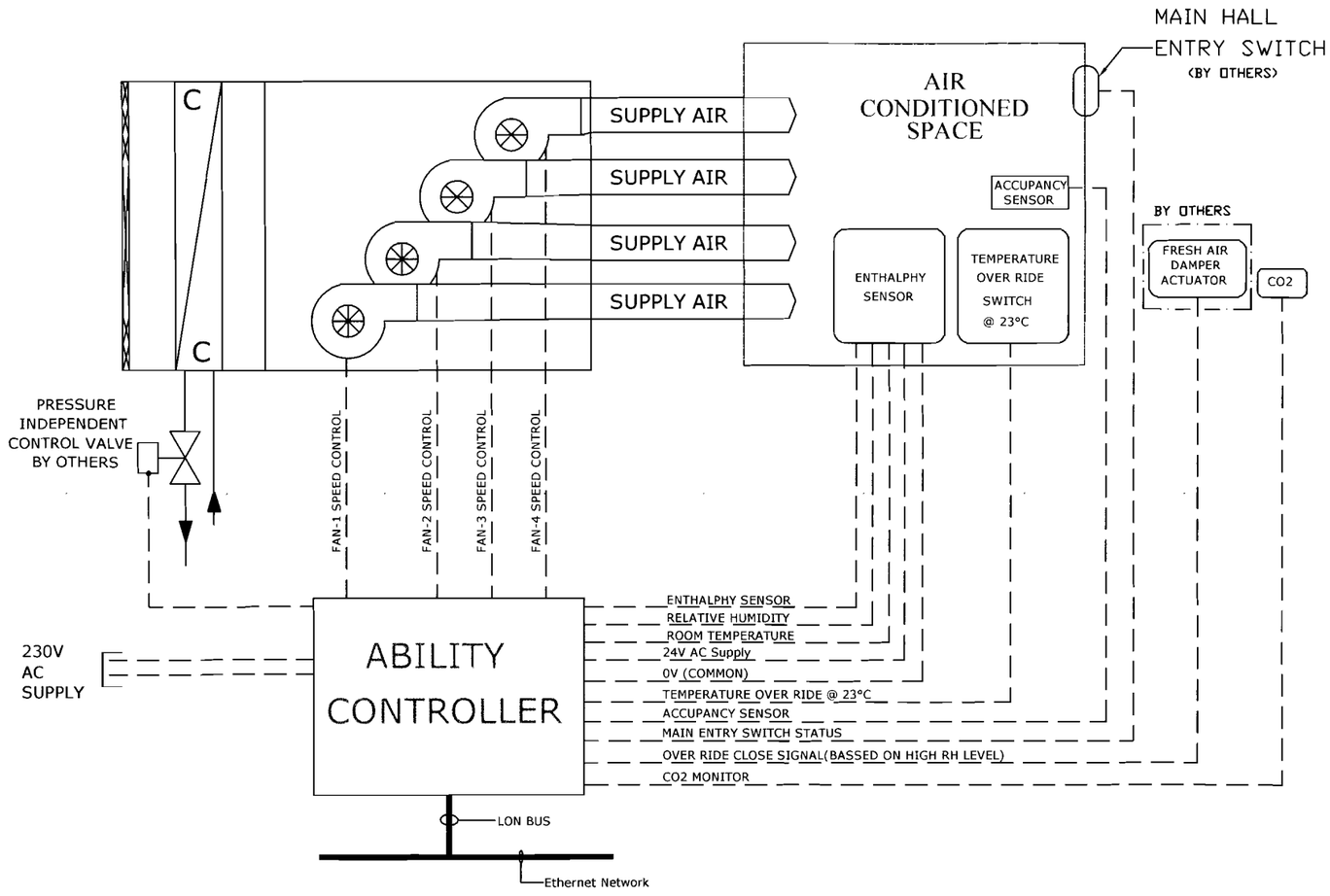
6. FCU Controller Schematic

FAN COIL UNIT RESIDENTIAL AREA (TYPICAL)

EC/DC FCU CONTROLLER(TYPICAL FCU WITH 4 SPIGOT UNIT)



PROJECT
MAZDAR INSTITUTE FOR SCIENCE AND TECHNOLOGY-PHASE 1A

CONSULTANT
pha CONSULT

MEP CONTRACTOR **STS.**
ABUDHABI.

MANUFACTURER OF BUILDING MANAGEMENT SYSTEM:
Ability projects ltd

LOCAL SUPPLIER:
VERGER et DELPORTE U.A.E. LTD.
LOW VOLTAGE DIVISION

Head Office: SHARJAH	DUBAI	ABU DHABI
P.O. Box 5629	P.O. Box 2264	P.O. Box 47010
Tel: 5432436	Tel: 2825289	Tel: 4434422
Fax: 5434139	Fax: 2825265	fax: 4465540

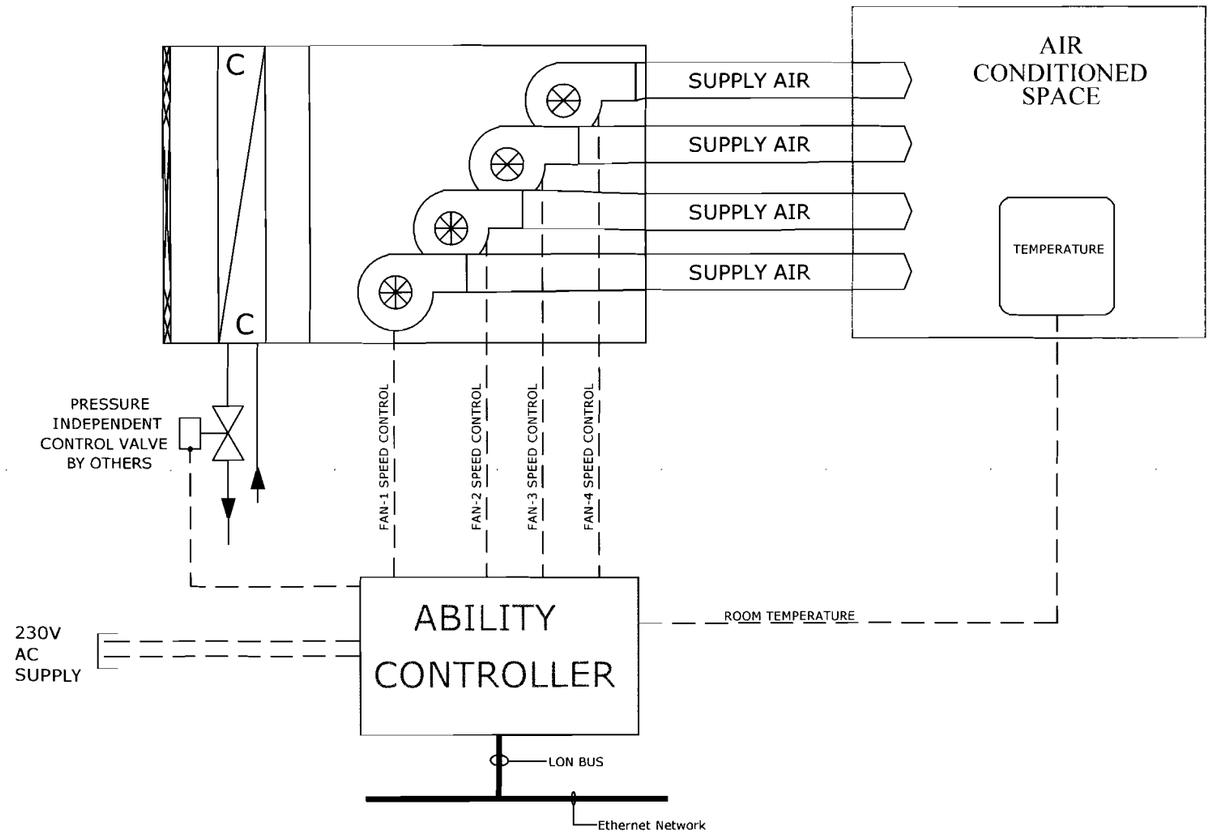
E-mail : verger@emirates.net.ae

Drawing Title
CONTROL SCHEMATIC FOR FCU
@ RESIDENTIAL AREA (TYPICAL)

Drawing No. : DIP/VD/BMS-10		Size. A4
Scale: NTS	Date: 05.05.09	Rev No. 0
Drawn: Syed	Checked: Syed	Approved: JOHN/HATEM

FAN COIL UNIT (RETAIL/RESTAURANT/RECEPTION/LABORATORY) AREA - TYPICAL

EC/DC FCU CONTROLLER(TYPICAL FCU WITH 4 SPIGOT UNIT)



PROJECT
MAZDAR INSTITUTE FOR SCIENCE AND TECHNOLOGY-PHASE 1A

CONSULTANT
pha CONSULT

MEP CONTRACTOR **STS.**
ABUDHABI.

MANUFACTURER OF BUILDING MANAGEMENT SYSTEM:
Ability projects ltd

LOCAL SUPPLIER:
VERGER et DELPORTE U.A.E. LTD.
LOW VOLTAGE DIVISION

Head Office: SHARJAH	DUBAI	ABU DHABI
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Tel: 5432436	Tel: 2825289	Tel: 4434422
Fax: 5434139	Fax: 2825285	fax: 4465540
E-mail : verger@emirates.net.ae		

Drawing Title
CONTROL SCHEMATIC FOR FCU
@RETAIL/RESTAURANT/RECEPTION/LAUNDRY(TYP)

Drawing No. : DIP/VD/BMS-10		Size. A4
Scale: NTS	Date: 05.05.09	Rev No. 0
Drawn: Syed	Checked: Syed	Approved: JOHN/HATEM

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7. Technical Data Sheets

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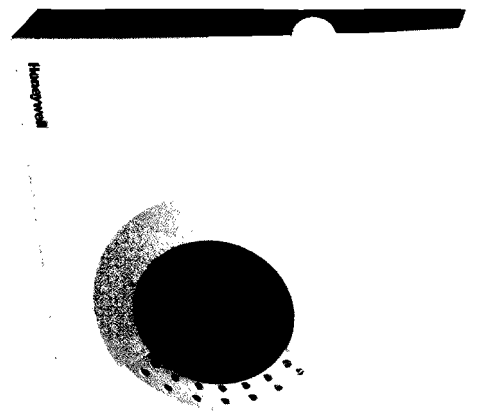
A. CO2 Sensor

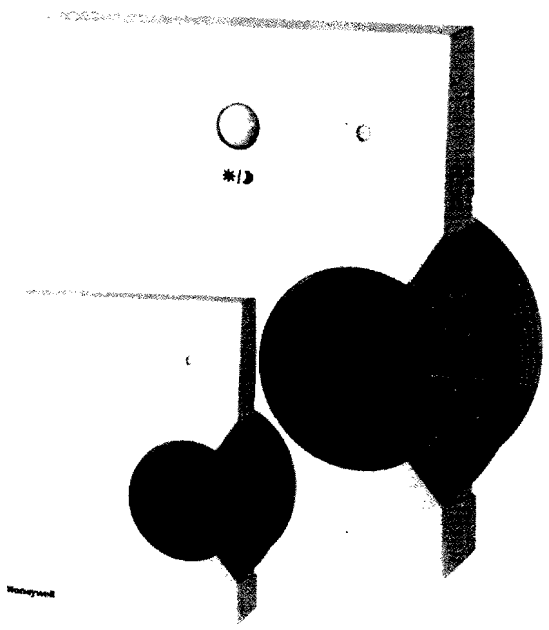


Honeywell

C7110C1001/D1009
WALL MODULES

HONEYWELL EXCEL 5000 OPEN SYSTEM

SPECIFICATION DATA



GENERAL

The C7110C1001 and C7110D1009 are wall modules which can be directly wired to Honeywell Excel 600, 500, 100, 50, and 20 Controllers.

Please refer to the technical specifications of the individual controllers in order to determine their suitability for use in conjunction with a given wall module application.

FEATURES

- **Mountable on 2.36 in. (60 mm) wall outlet box or directly on a wall.**
- **With setpoint adjustment dial (Celsius relative or Celsius absolute scale) (C7110D1009, only).**
- **With CO_2 sensor and LED indicating either CO_2 level (C7110C1001) or occupancy (C7110D1009).**
- **With space temperature sensor (C7110D1009, only).**
- **With occupancy bypass button (C7110D1009, only).**
- **Locking cover on all models.**
- **Operating range 43 to 104°F (6 to 40°C).**
- **CE approved.**
- **IP 30 housing.**
- **Compact.**
- **Configurable using Honeywell's free UIP software module (see section "Specifications" on page 4).**
- **Self-calibrating.**
- **CO_2 output (pin 2) configurable as an analog or binary output.**
- **Life-span: min. 13 years.**

DESCRIPTION

The C7110C1001 is equipped with a CO_2 sensor. The C7110D1009 is equipped with both a CO_2 sensor and a space temperature sensor.

The C7110D1009 also features a setpoint adjustment dial. By default, the "Celsius Relative" type (-5 to +5) is mounted, but can be easily replaced with the "Celsius Absolute" type (12 to 30°C).

The C7110C1001 features a CO_2 level LED.

The C7110D1009 features an occupancy bypass button and an occupancy LED.

CE

SPECIFICATIONS

Table 1. C71100C1001 and C71100D1009 Wall Module models

model no.	space temp. sensor	CO_2 sensor	setpoint adjustment dial	occupancy bypass button	LED	compatible with the following Honeywell controllers
C7110C1001	--	✓	--	--	CO_2 level	Excel 600, 500, 100, 50, and 20
C7110D1009	✓	✓	12 to 30°C (abs.) ± 5 K (rel.)	✓	occupancy	

NOTE: For wall module settings and wiring diagrams, refer to the C7110C,D Installation Instructions (product literature no.: EN1B-0257GE51). Some features may not be available with all controllers (see Table 1).

Construction:
Two-piece construction, a cover and an internally wired sub-base. Field wiring 16 to 22 AWG (1.5 to 0.34 mm^2) connects to a terminal block on the PCB.

Temperature Sensor Operating Range:
43...104°F (6...40°C).

Temperature Sensor Accuracy

20 kΩ Sensor:
The C7110D1009 is equipped with a 20 kΩ NTC temperature sensor following a specific temperature-resistance curve (see Fig. 1).

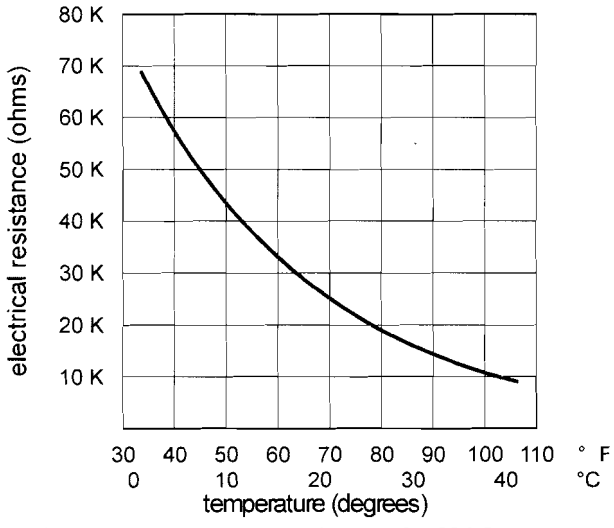


Fig. 1. Temperature vs. resistance for 20 kΩ sensor

Honeywell controllers used with these Wall Modules employ an algorithm that provides readings close to the actual temperature. Table 2 summarizes the sensor accuracy for normal operating temperatures.

Table 2. Temperature sensor accuracy

ambient temperature °F (°C)	max. error °F (°C)	nominal resistance (Ω)
60 (15.5)	±0.52 (±0.29)	31543
65 (18.3)	±0.49 (±0.27)	27511
70 (21.1)	±0.48 (±0.27)	24047
80 (26.7)	±0.49 (±0.27)	18490
85 (29.5)	±0.52 (±0.29)	16264

C7110D Setpoint Adjustment:
In the case of the C7110D, which is equipped with a setpoint adjustment dial, depending on the type of dial in use, the corresponding controller must be set for either the relative or the absolute scale. The relation between setpoint and resistance is given in Table 3. Accuracy of resistance is:

- ±5% in middle position, e.g. 5225 Ω to 5775 Ω
- ±10% in end position, e.g. 9450 Ω to 11550 Ω.

Table 3. Setpoint values versus resistances

relative scale (Kelvin)		absolute scale (°C)	
setpoint	nominal resistance (Ω)	setpoint	nominal resistance (Ω)
-5	9574.0	12	9958.0
-4	8759.2	13	9468.7
-3	7944.4	14	8979.3
-2	7129.6	15	8490.0
-1	6314.8	16	8000.7
0	5500.0	17	7511.3
1	4685.2	18	7022.0
2	3870.4	19	6532.7
3	3055.6	20	6043.3
4	2240.8	21	5554.0
5	1426.0	22	5064.7
		23	4575.3
		24	4086.0
		25	3596.7
		26	3107.3
		27	2618.0
		28	2128.7
		29	1639.3
		30	1150.0

Configuration of Pin 2

The CO_2 output (pin 2) of the C7110C/D Wall Modules can be configured (using the UIP software module – see also section "UIP Software Module" on page 4).

In order to use the UIP software module to reconfigure pin 2, you must first connect the Wall Module's four-prong male connector (located to the right of the terminal block on the PCB after removing the cover; see Fig. 2) to one of your PC's serial communication ports; this is done using the HDI 10 Interface Cable, available as an accessory (see section "HDI 10 Interface Cable" on page 4).

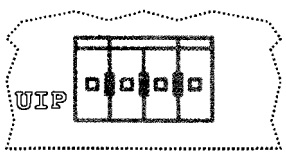


Fig. 2. Four-prong male connector

Upon then starting the UIP software program (only one instance of which may be active on your PC at a time), a window will appear in which you must specify to which of your PC's serial communication port you have connected the four-prong male connector.

Following this, a second window (the "configuration window") will appear in which you can configure pin 2 in a variety of fashions (see following sub-sections).

NOTE: If your PC is not equipped with a mouse or track ball, you can navigate forwards by pressing your PC's TAB key, and backwards by pressing SHIFT + TAB. Further, you can check/uncheck selections using the SPACE key

Voltage Output

In the left-hand area (labeled "Voltage Output") of the configuration window, you can select either

- the "Scaled Output" checkbox (this is the default setting) or
- the "Relay Output" checkbox.

Scaled Output (Analog Output)

If you select the "Scaled Output" checkbox, pin 2 will deliver analog output. In this case, you can then configure a measuring range of either

- 0 ppm to 2000 ppm or
- 0 ppm to 3000 ppm.

You can then also configure pin 2 for either

- 0...10 V analog output or
- 2...10 V analog output.

NOTE: After having selected "Scaled Output," the CO2 level LED of the C7110C is disabled.

Relay Output (Digital Output)

If you select the "Relay Output" checkbox, pin 2 will deliver digital output. In this case, you can then configure a "Threshold Level (PPM)" of any value between 0 and 2000 ("600" is the default setting), and a "Hysteresis (PPM)" of any value between 1 ppm and 50% of the "Threshold Level (PPM)" ("100" is the default setting).

See Fig. 3 for the resultant output of pin 2 and (in the case of the C7110C) the corresponding behavior of the CO_2 level LED.

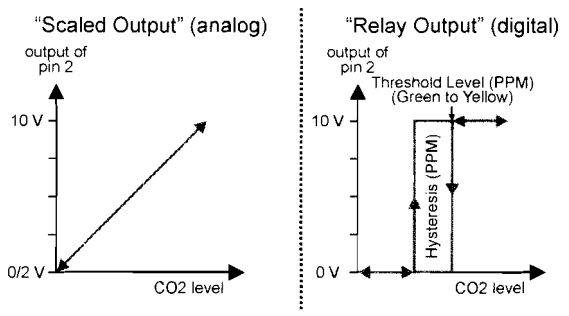


Fig. 3. Configuration of pin 2 and resultant output

In the case of the C7110C, the resultant output is applied to the LED input (pin 6). The CO_2 level LED will thus glow green below and yellow above the threshold level.

Occupancy Bypass Button / Occupancy LED (C7110D1009, only)

Overrides can result e.g. from the controller's own internal programming. In the case of the C7110D1009, overrides can also result from pressing the occupancy bypass button (see also Fig. 4).

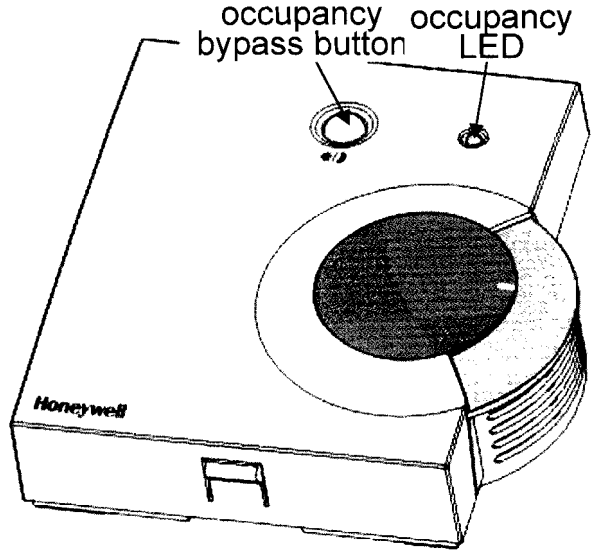


Fig. 4. C7110D1009

The functionality of the occupancy bypass button and the resultant behavior of the occupancy LED are dependent upon the given controller. Please refer to the Technical Literature pertaining to the specific controller

With Excel 600/500/100/50/20 Controllers

All Excel 600, 500, 100, 50, and 20 Controllers are fully programmable. The application engineer/programmer can program the occupancy bypass button and the occupancy LED to operate in any manner desired.

The bypass (override) output pin (pin 7 of the C7110D1009) is a normally-open, digital tactile switch.

Contact your local Honeywell distributor for further details.

SPECIFICATIONS

Mounting options: The wall modules can be mounted on a 60 mm diameter junction box or directly on a wall.

Dimensions (H × W × D): 4-1/8 × 3-15/16 × 1-3/16 in. (104 × 99 × 30 mm).

Operating Temperature: 43...104°F (6...40°C).

Shipping Temperature: -40...+150°F (-40...+65°C).

Relative Humidity: 5...95%, non-condensing.

Measurement range: 0...2000 ppm (factory default); adjustable to 3000 ppm using UIP software kit

Accuracy: ±100 ppm or 7% (whichever is greater)

Elevation (Pressure) correction: Add 0.13% of reading per mm Hg below 760 mm Hg (on-board correction, user-set using UIP software)

Response time, 0...90%: < 5 min

Warm-up time: < 2 min

Agency certification: FCC Part 15 Class B, CE, California Energy Commission

Power:
- 18...30 Vac rms, 50/60 Hz (half-wave, rectified)
- 18...42 Vdc (polarity protected)
- 1.75 VA max. average power
- 2.75 VA peak power

Analog output (simultaneous): 0...10 Vdc (100 Ω output impedance), 4...20 mA (external RL_{max} = 500 Ω)

ACCESSORIES

For mounting the following accessories, please refer to the C7110C,D Installation Instructions (product literature no.: EN1B-0257GE51).

T7460-LONJACK

The T7460-LONJACK is a small board and allows easy access to LONWORKS via the wall module (the wall module must be already connected, in compliance with the max. cable lengths set forth by the LONWORKS Guidelines, to the LONWORKS network via a LONWORKS bus cable). Via an additional 3.5 mm jack plug on the board, a PC connection can be established.

Order quantity: set of 5 pieces

T7460-LIMITER

The T7460-LIMITER (for the C7110D1009, only) can be used to limit the setpoint dial to within a narrower range.

Order quantity: set of 100 pieces

UIP Software Module

The default settings of the C7110C,D can be reconfigured using the UIP software module, which can be downloaded free of charge from the Honeywell Plug-In Download Area at the following URL:

http://web.ge51.honeywell.de/productsupport/website/Sensors.htm

HDI 10 Interface Cable

Accessory for connecting the C7110C,D Wall Module to your PC for the purpose of configuring the Wall Module using the previously-downloaded UIP Software Module.

Honeywell

Manufactured for and on behalf of the Environmental and Combustion Controls Division of Honeywell Technologies Sàrl, Ecublens, Route du Bois 37, Switzerland by its Authorized Representative:

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DIN EN
ISO 9001

EN0B-0457GE51 R1005 printed in Germany

Honeywell

C7110C1001/D1009
WALL MODULES

HONEYWELL EXCEL 5000 OPEN SYSTEM

INSTALLATION INSTRUCTIONS

BEFORE INSTALLATION

All wiring must comply with local electrical codes and ordinances or as specified on installation wiring diagrams.

Wall module wiring can be sized from 16 to 22 AWG (1.5 to 0.34 mm^2), depending on the application. The maximum length of wire from a device to a wall module is 1000 ft (305 m). Twisted-pair wire is recommended for wire runs longer than 100 ft (30.5 m).

Removing Cover

The cover of the wall module is fixed in place using a tab located on the underside of the unit; to remove the cover from the subbase, see Fig. 1.

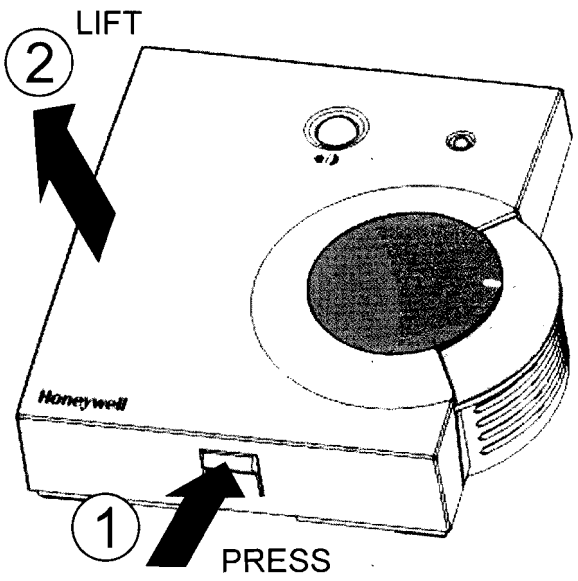

Fig. 1. Cover disassembly

FEATURES

Table 1. Features of the C7110C,D

	CO_2 sensor	space temp. sensor	setpoint dial	LED
C7110C	✓	--	--	CO_2 level
C7110D	✓	✓	✓	occupancy

INSTALLATION

The C7110D packages include two setpoint dials. By default, the "Celsius Relative" type is mounted. This can be easily replaced with the "Celsius Absolute" type by pulling the one dial off and inserting the other one.

Mount the C7110C,D Wall Modules on an inside wall approx. 54 in. (1.3 m) from the floor (or in the specified location) to allow exposure to the average zone temperature.

NOTE: Maintain a mounting clearance of approx. 4 in. (10 cm) to the left-hand side of the module in order to allow a free airflow for the temperature sensor and accessibility of the setpoint dial.

Do not mount the wall modules on an outside wall, on a wall containing water pipes, or near air ducts. Avoid locations exposed to discharge air from registers or radiation from lights, appliances, or the sun.

Keep wiring at least one ft (305 mm) away from large inductive loads such as motors, line starters, lighting ballasts, and large power distribution panels.
Run wall module wiring separately from 50 Vac or greater power wiring.

The wall modules can be mounted on a 60-mm wall outlet box using No. 6 (3.5-mm) screws or on a wall (see Fig. 2). When mounting directly on a wall, use the type of screws appropriate for the wall material.

See Fig. 2 for C7110C,D mounting dimensions.

CE

EN1B-0257GE51 R1105C

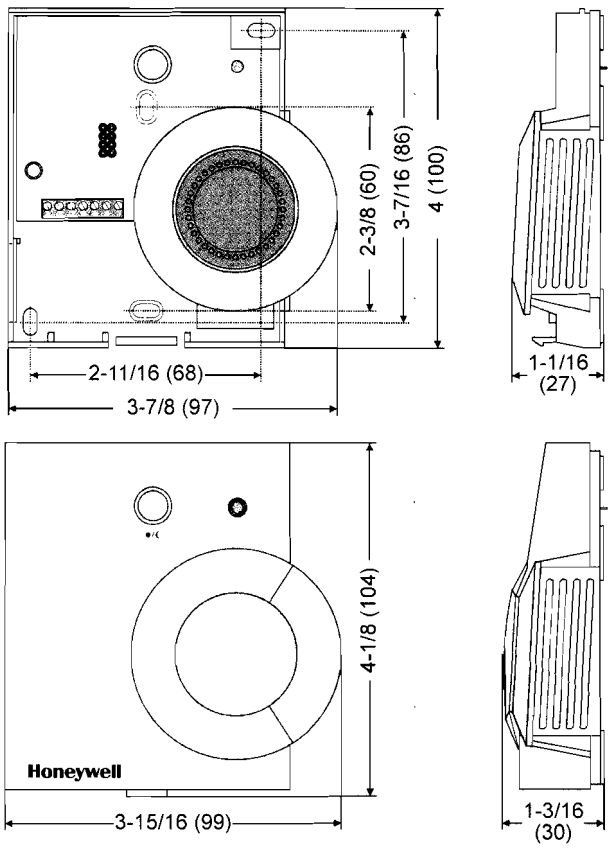

Fig. 2. C7110C,D bore-holes, dimensions in in. (mm)

Mounting Procedure

1. Disassemble the cover as is shown in Fig. 1.
2. Remove the setpoint dial by pulling it off.
3. **a)** Mount the wall module onto the wall outlet box,
   or
   b) bore wall holes as is specified in Fig. 2 and mount the wall module with appropriate screws.
4. Connect the wires to the terminal block according to the specifications in section "Wiring".
5. Insert the setpoint dial and turn it clockwise as far as possible.
6. Make sure that the dial's position is such that the 30 (Celsius absolute scale) or the +5 (Celsius relative scale) point to the right-hand side of the wall module (see Fig. 3).

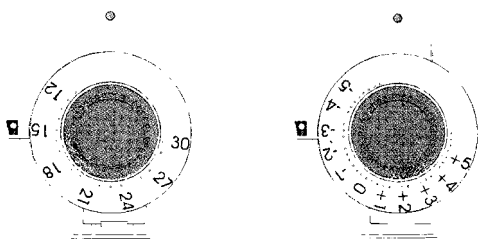

Fig. 3. Mounting position of setpoint dial

7. If the dial does not have the correct position, pull the dial off again and reinsert it with the correct orientation.
8. Remount the cover as depicted in Fig. 4 and make sure that the tab on the underside engages.

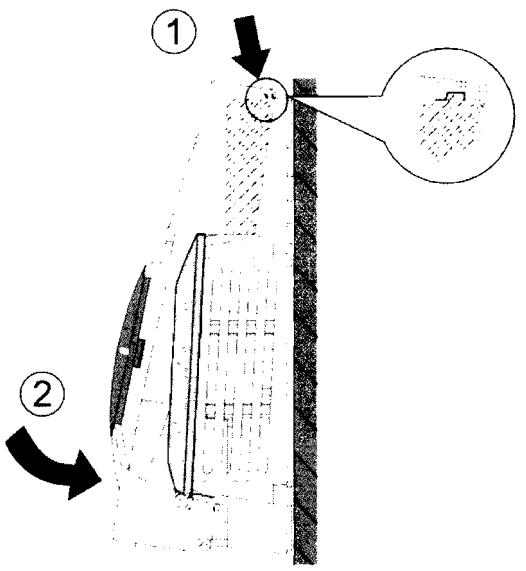

Fig. 4. Mounting cover of C7110C,D Wall Modules

Wiring

Attach the wires from the device sensor terminals to the appropriate wall module terminals. See Fig. 5.

IMPORTANT

Screw type terminal blocks are designed to accept no more than one 16 AWG (1.5 mm2) conductor.

Wire the terminal blocks as follows:

1. Strip 3/16 in. (5 mm) of insulation from the conductor.
2. Insert the wire in the required terminal location and tighten the screw to complete the termination.
3. Verify wall module wiring with Fig. 5.

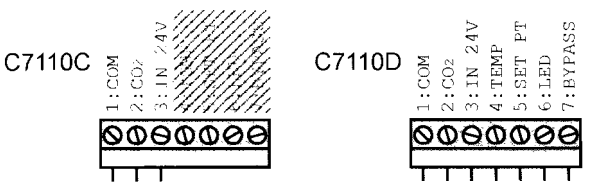

Fig. 5. Wiring diagrams for C7110C,D Wall Modules

ACCESSORIES

T7460-LONJACK

The T7460-LONJACK is a small board and allows easy access to LONWORKS via the wall module (the wall module must be already connected, in compliance with the max. cable lengths set forth by the LONWORKS Guidelines, to the LONWORKS network via a LONWORKS bus cable). Via an additional 3.5 mm jack plug on the board, a PC connection can be established.

Order quantity: set with 5 pieces

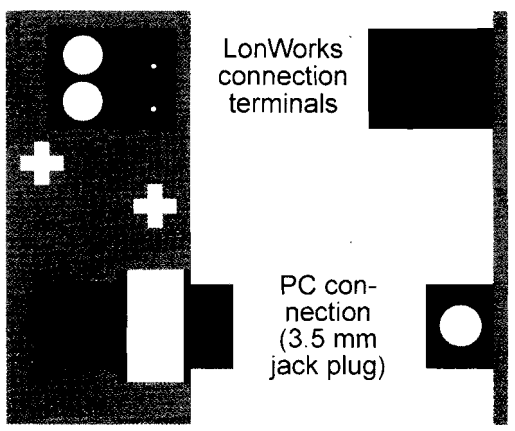

Fig 9. T7460-LONJACK

Mounting

Remove the setpoint dial and insert the T7460-LONJACK as shown in the following:

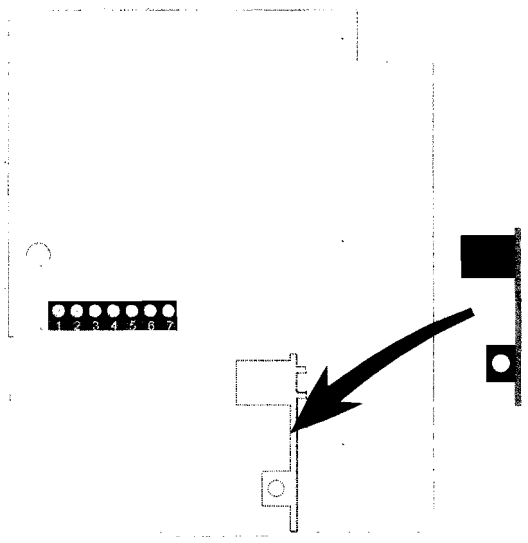

Fig 10. Mounting T7460-LONJACK

T7460-LIMITER

The T7460-LIMITER can be used to limit the setpoint dial to within a narrower range.

Put the limiters approximately opposite the setpoints you want to adjust. In the following example, the setpoint limits are at about 18 and 27 °C.

Order quantity: set of 100 pieces

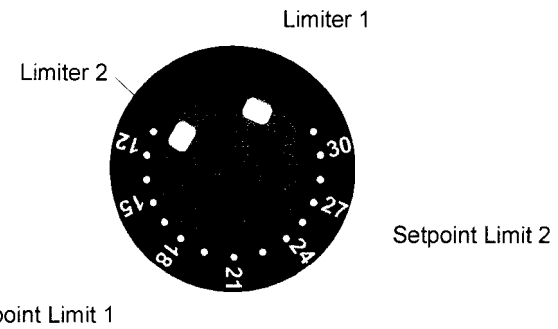

Fig 11. Mounting T7460-LIMITER(S)

UIP Software Module

The default settings of the C71101C,D can be reconfigured using the UIP software module, which can be downloaded free of charge from the Honeywell Plug-In Download Area at the following URL:

http://web.ge51.honeywell.de/productsupport/website/Sensors.htm

In order to use the UIP software module to reconfigure the C71101C,D Wall Modules, you must first connect the Wall Module's 4-prong male connector (located to the right of the terminal block on the PCB) to your PC via the HDI 10 Interface Cable, available as an accessory (see below).

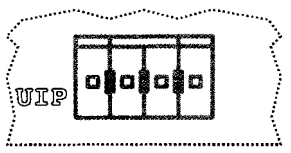

Fig. 6. 4-prong male connector (accessible after removing cover)

NOTE: Only one instance of the UIP software may be active on your PC at a time.

HDI 10 Interface Cable

Accessory for connecting the C71101C,D Wall Module to your PC for the purpose of configuring the Wall Module using the previously-downloaded UIP Software Module.

SPECIFICATIONS

Mounting options: The wall modules can be mounted on a 60 mm diameter junction box or directly on a wall.

Dimensions (H × W × D): 4-1/8 × 3-15/16 × 1-3/16 in. (104 × 99 × 30 mm).

Operating Temperature: 43...104°F (6...40°C).

Shipping Temperature: -40...+150°F (-40...+65°C).

Relative Humidity: 5...95% non-condensing.

Measurement range: 0...2000 ppm (factory default); adjustable to 3000 ppm using UIP software kit

Accuracy: ±100 ppm or 7% (whichever is greater)

Elevation (Pressure) correction: Add 0.13% of reading per mm Hg below 760 mm Hg (on-board correction, user-set using UIP software)

Response time, 0...90%: < 5 min

Warm-up time: < 2 min

Agency certification: FCC Part 15 Class B, CE, California Energy Commission

Power:
- 18...30 Vac rms, 50/60 Hz (half-wave, rectified)
- 18...42 Vdc (polarity protected)
- 1.75 VA max. average power
- 2.75 VA peak power

Analog output (simultaneous): 0...10 Vdc (100 Ω output impedance), 4...20 mA (external RL_{max} = 500 Ω)

Honeywell

Manufactured for and on behalf of the Environmental and Combustion Controls Division of Honeywell Technologies Sàrl, Ecublens, Route du Bois 37, Switzerland by its Authorized Representative:

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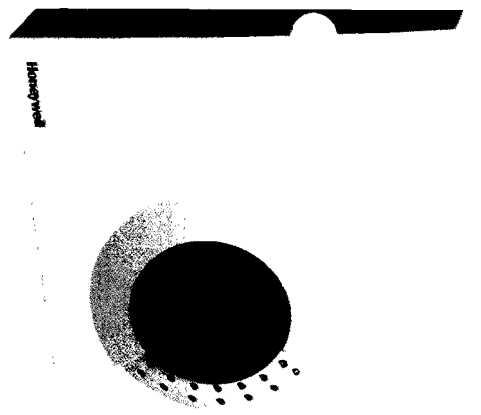
EN1B-0257GE51 R1105C

Ability projects ltd

Verger et Delporte UAE Ltd

B. Room RH & Temperature Module

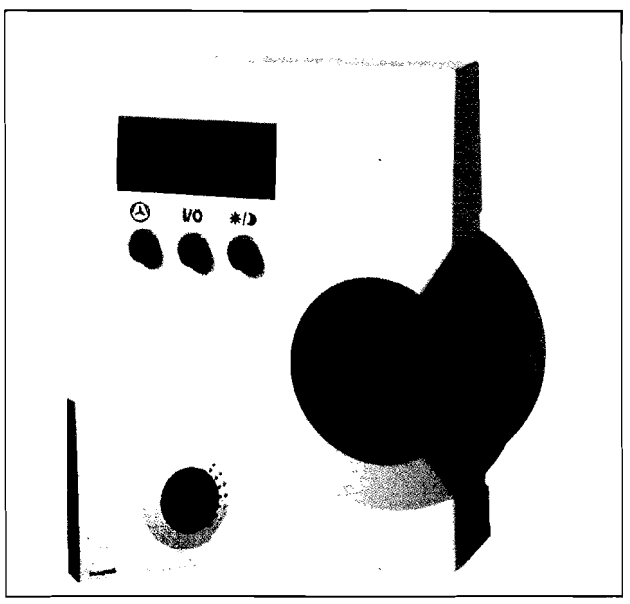


Honeywell

T7560A,B,C Digital Wall Module

HONEYWELL EXCEL 5000 OPEN SYSTEM

SPECIFICATION DATA



FEATURES

- Fully compatible with all current Excel 10 and Excel 20 to 600 controllers.
- Low power consumption.
- Integral 20kΩ NTC sensor.
- Separate mounting base for easy installation.
- Tamper-resistant locking cover.
- IP30 housing.
- T7560A and B, only:
  - LCD display continuously shows current space temperature, occupied/unoccupied/standby mode, fan status/mode, humidity, as configured.
  - Push-button interface for full navigation and change control of wall module functions.
  - Single-touch occupied/unoccupied override.
  - Setpoint dial for setpoint adjustment.
  - Fan Speed/Mode commandable from buttons.
  - Selectable °F/°C temperature display.
  - Selectable setpoint type, absolute or relative.

GENERAL

The T7560A,B Digital Wall Modules (DWM) display and provide space temperature, setpoint, Occupied/Unoccupied override, and fan mode/speed selection for the Honeywell Excel 10 W7750, W7751, W7752, W7753, W7761, W7762, W7763, and Excel 600, 500, 100, 50, 20 Controllers, as applicable (a software module ModAL is available to adapt the wall module to the respective Excel 20, 50, 100, 500, 600 controller. See T7560A,B,C Installation Instructions (product literature no.: EN1B-0146GE51) for details.

Using the three buttons, the user can change room temperature setpoint, fan mode/speed, initiate/cancel bypass, and change configuration information such as the DWM's engineering units.

The T7560C Digital Wall Module (see inset above) has no user interface (e.g. LCD, buttons, or setpoint dial) and issues only temperature and humidity values.

These wall modules are not compatible with Honeywell W7751A,C,E,G (VAV1) and W7752D1 (FCU1) Controllers.

CE

SPECIFICATIONS

Models

Table 1. Types of DWM

	sensor[1]	colors (dial / housing)	pre-conf. units
T7560A1000	Tmp	blue/white	°C
T7560A1026	Tmp	white/white	°C
T7560A1018	Tmp	white/white	°F
T7560A1042*	Tmp	white/white	°F
T7560B1008	Tmp/Hum	blue/white	°C
T7560B1024	Tmp/Hum	white/white	°C
T7560B1016	Tmp/Hum	white/white	°F
T7560B1032*	Tmp/Hum	white/white	°F
T7560C1006	Tmp/Hum	blue/white	n.a.

[1] Tmp = Temperature sensor; Hum = Humidity sensor

*U.S. versions with mounting base.

Temperature Sensor Accuracy

The DWM is furnished with a 20kΩ NTC temperature sensor that follows a specific temperature-resistance curve. See Fig. 1. Honeywell controllers used with the DWM employ an algorithm that provides readings close to the actual temperature. Table 2 summarizes the DWM sensor accuracy for normal operating temperatures. Across the range of 43 to 104°F (6 to 40°C), the accuracy is better than ±0.75°F (±0.42°C).

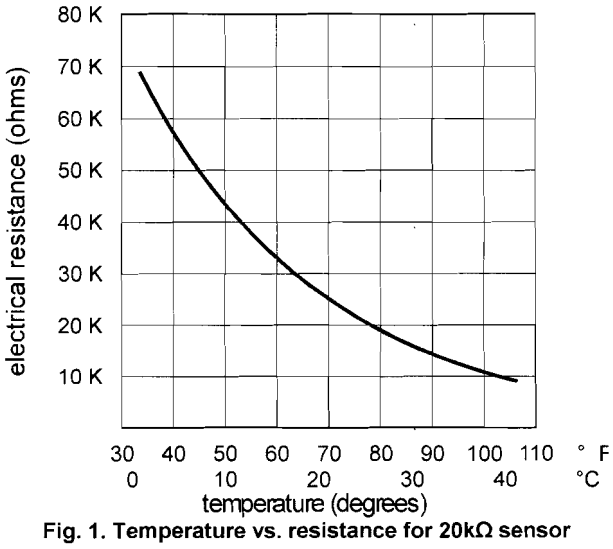


Fig. 1. Temperature vs. resistance for 20kΩ sensor

Table 2. Temperature sensor accuracy

ambient tem. (°C)	max. error (°C)	nominal resistance (Ω)
15.5	±0.29	31543
18.3	±0.27	27511
21.1	±0.27	24047
26.7	±0.27	18490
29.5	±0.29	16264

Humidity Sensor

Table 3. Humidity sensor specifications

parameter	value
humidity sensing range	10...95% r.h.
output signal	1...10 Vdc (10...100% r.h.)
accuracy	±5% (full-scale)

Fan Speed Button (T7560A,B, only)

Table 4. Fan speed resistances

switch position	resistance (Ω)	fan behavior
auto	1861.4 ±100	runs as scheduled
0	2686.4 ±100	OFF
1	3866.4 ±100	runs at speed 1
2	3041.4 ±100	runs at speed 2
3	4601.4 ±100	runs at speed 3
bypass activated	0...100	unchanged

NOTE: If connected to Excel 10 UV Controller W7753, fan output will not be shorted to ground on pressing the BYPASS button; with every other Excel 10 Controller, it will be shorted.
See T7560A,B,C Installation Instructions (product literature no.: EN1B-0146GE51) for configuration.

Power Supply

24 Vac/dc with a valid range of 18...30 V
5 Vdc via LED input with a valid range of 5...15 V
See T7560A,B,C Installation Instructions (product literature no.: EN1B-0146GE51) for details.

Power Consumption

<0.2 VA at 24 Vac, 50/60 Hz

DWM Setpoint Adjustment

The relation between setpoint and resistance is given in Table 5 and Table 6. Accuracy of resistance is:

- ±5% in middle position, e.g. 5225 Ω to 5775 Ω
- ±10% in end position, e.g. 9450 Ω to 11550 Ω.

Setpoint accuracy: ± 0.2 K

Table 5. Setpoint values vs. resistances (Celsius)

setpoint rel./K	nom. res. (Ω)
-5	9574.0
-4	8759.2
-3	7944.4
-2	7129.6
-1	6314.8
0	5500.0
1	4685.2
2	3870.4
3	3055.6
4	2240.8
5	1426.0

setpoint abs./°C	nom. res. (Ω)
12	9958.0
13	9468.7
14	8979.3
15	8490.0
16	8000.7
17	7511.3
18	7022.0
19	6532.7
20	6043.3
21	5554.0
22	5064.7
23	4575.3
24	4086.0
25	3596.7
26	3107.3
27	2618.0
28	2128.7
29	1639.3
30	1150.0

Table 6. Setpoint values vs. resistances (Fahrenheit)

setpoint rel./K	nom. res. (Ω)
-10	10026.7
-9	9574.0
-8	9121.3
-7	8668.7
-6	8263.7
-5	7763.3
-4	7310.7
-3	6858.0
-2	6405.3
-1	5952.7
0	5500.0
1	5047.3
2	4594.7
3	4142.0
4	3689.3
5	3236.7
6	2784.0
7	2331.3
8	1878.7
9	1426.0
10	973.3

setpoint abs./°C	nom. res. (Ω)
55	9577.4
57	9033.7
59	8490.0
61	7946.3
63	7402.6
65	6858.9
67	6315.2
69	5771.5
70	5499.6
71	5227.8
73	4684.1
75	4140.4
77	3596.7
79	3053.0
81	2509.3
83	1965.6
85	1421.9

Field Wiring

- 16 to 22 AWG (1.5 to 0.34 mm²) depending on application.
- 18 AWG (1.0 mm²) min. for 24 Vac power wiring.
- Max. length of wire from a device to a wall module is 164 ft (50 m).
- Twisted pair wire recommended for wire runs longer than 100 ft (30.5 m).

Setpoint Adjustment Range (A and B)

Setpoint can be configured for
- Fahrenheit absolute (55...85 °F)
- Fahrenheit relative (± 10)
- Celsius absolute (12...30 °C)
- Celsius relative (± 5)

Temperature Value Display Resolution (A and B)

Degree Celsius ⇒ 0.1 °C
Degree Fahrenheit ⇒ 0.1 °F

Setpoint Value Display Resolution (A and B)

Degree Celsius ⇒ 0.5 °C
Degree Fahrenheit ⇒ 1.0 °F

Mounting Options

Wall mounting

Dimensions (H/W/D)

4-1/8 x 3-15/16 x 1-3/16 in. (104 x 99 x 30 mm)

Environmental Ratings

Shipping temperature: -22...+140 °F (-30...60 °C)
Operating temperature: 32...104 °F (0...+40 °C)
Relative humidity: 5...95% non-condensing
Measurement range: +6...+40 °C

Approval Bodies

UL 916, NEC Class 2
CE

OPERATION OF THE DWM

Table 7. Supported DWM functions with Excel 10 Controllers

	bypass	unit enable	fan override	setpoint	humidity	room temp.
W7750 CVAHU	✓	N/A	N/A	✓	✓	✓
W7751 VAV	✓	N/A	N/A	✓	N/A	✓
W7752 FCU	✓	✓	✓	✓	N/A	✓
W7753 UV	✓	✓	✓	✓	✓	✓
W7761 RIO	N/A	N/A	N/A	N/A	✓	✓
W7762 HYD	✓	N/A	N/A	✓	N/A	✓
W7763 CHC	✓	N/A	N/A	✓	✓	✓

General

The T7560A and T7560B feature three buttons, a setpoint dial, and the LCD display (see Fig. 2). This section describes the functions of these elements. Table 7 shows the functions available with the different Excel 10 Controllers.

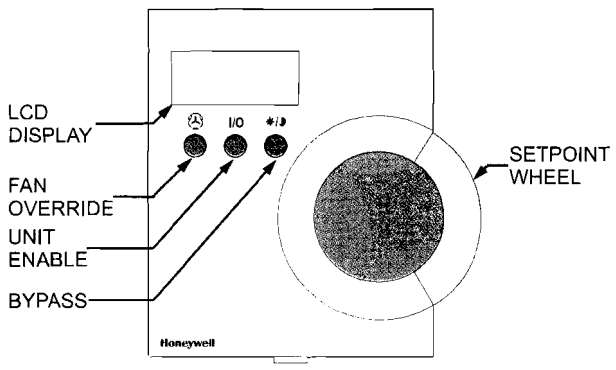


Fig. 2. Control elements of DWM.

NOTE: If not specified differently, the graphics given below show example display settings; depending on configuration, the actual indications may vary from those shown hereinafter.

Set Temperature

Depending on the configuration, you can adjust the temperature within the limits given below:

°C absolute ⇒ 12 to 30°C (in 0.5 steps)
°C relative ⇒ -5 to +5 (in 0.5 steps)
°F absolute ⇒ 55 to 85°F (in 1.0 steps)
°F relative ⇒ -10 to +10 (in 1.0 steps)

Turn the SETPOINT DIAL up/down to decrease/increase the room temperature setpoint. The display toggles the setpoint value (either relative or absolute, as configured).

After the new setpoint has been set, the display returns to normal mode after approx. 5 sec.

Set Fan Speed

The manually set fan speed is represented by a bargraph. Depending on configuration, the fan speed can be set as follows:

Three-speed fan override ⇒ AUTO, OFF, 1, 2, 3
Two-speed fan override ⇒ AUTO, OFF, 1, 2
Fan mode override ⇒ AUTO, OFF, ON

NOTE: The default setting after power-up is AUTO. The manually set fan speed overrides the controller's control algorithm.

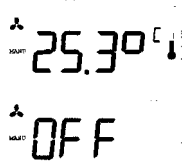
Three-speed fan override

Press the FAN OVERRIDE button to toggle between:

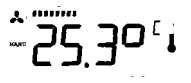
AUTO (fan speed from controller)

MANU OFF (fan off)

With this setting, depending on configuration, the display may also read:

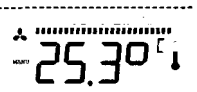


MANU 1 (fan speed 1)



MANU 2 (fan speed 2)

MANU3 (fan speed 3)



Two-speed fan override

Press the FAN OVERRIDE button to toggle between:

AUTO (fan speed from controller; display: see above)
MANU OFF (fan off; display: see above)
MANU 1 (fan speed 1; display: half bargraph)
MANU 2 (fan speed 2; display: full bargraph)

Fan mode override

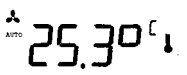
Press the FAN OVERRIDE button to toggle between:

AUTO (fan speed from controller; display: see above)
MANU OFF (fan off; display: see above)
MANU ON (fan on; display: full bargraph)

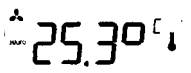
Set Fan Mode

The UNIT ENABLE button switches the fan mode between AUTO and MANU OFF:

AUTO
(fan speed from controller)



MANU OFF
(fan off)

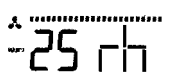


With this setting, depending on configuration, the display may also read:

Humidity Display

The T7560B is capable of displaying the relative humidity. To display the relative humidity, it must be configured in mode P2:3. The relative humidity (in %, together with the corresponding letters "rh") and the room temperature will then be displayed, alternating every 5 seconds.

Humidity mode
(e.g. 25% relative humidity)



Set Bypass/Occupancy Mode Display

The bypass function can be used to override the control algorithm generated by the controller (e.g. for an event after normal office hours, or for a room known to be unused). The status of the occupancy mode can be seen from the sun, moon, and snowflake symbols. The following LCD behaviors are possible, depending on configuration. See T7560A,B,C Installation Instructions (product literature no.: EN1B-0146GE51) for configuration options:

Occupancy mode display for Excel 10 LCD signaling (Excel 10 set to LCD_DISPLAY; with FCU, HYD, and CHC, only.)

Effective Occupancy or Bypass mode
(SUN continuously ON)

Effective Standby mode; generated by time program
(HALF-SUN continuously ON)

Effective Unoccupancy mode
(MOON continuously ON)

Unit Off, No Frost Protection
(OFF without snowflake)

Unit Off, With Frost Protection
(OFF WITH SNOWFLAKE)

Override Standby mode (from central)
(HALF-SUN FLASHING)

Wink mode (NEURON© ID sent)
(SUN/MOON/SNOWFL. FLASHING)
(Only with FCU, HYD, CHC)

Press the BYPASS button to set the desired mode:

- *To activate Override Occupancy or Bypass mode, press and release the BYPASS button.*
- *To activate Override Unoccupancy mode, press and hold the BYPASS button for at least 5 sec.*
- *To return to normal mode, press and release the BYPASS button again.*

NOTE: Pressing the BYPASS button for more than 5 seconds sends the NEURON© ID of the connected Excel 10 controller via the LONWORKS© network.

Override Occupancy or Bypass mode
(SUN FLASHING)

Override Unoccupancy mode
(MOON FLASHING)

Override mode display for Excel 10 LED signaling (Excel 10 set to LED_OVERRIDE)

Off Conditions, No Override, Overr. Occupancy, Overr. Standby (NO SYMBOLS)

Wink mode (NEURON© ID sent)
(SUN/MOON/SNOWFL. FLASHING)
(Only with FCU, HYD, CHC)

Press the BYPASS button to set the desired mode:

- To activate Override Bypass mode, press and release the BYPASS button.
- To activate Override Unoccupancy mode, press and hold BYPASS button for at least 5 sec.
- To return to normal mode, press and release the BYPASS button again.

NOTE: Pressing the BYPASS button for more than 5 seconds sends the NEURON© ID of the connected Excel 10 controller via the LONWORKS© network.

Override Bypass mode
(SUN FLASHING)

Override Unoccupancy mode
(MOON FLASHING)

Occupancy mode display for Excel 10 LED signaling (Excel 10 set to LED_OCCUPANCY)

Effective Bypass mode
(SUN continuously ON)

Effective Standby mode; generated by time program
(HALF-SUN continuously ON)

Off Conditions, Effective Unoccupancy mode
(MOON continuously ON)

Wink mode (NEURON© ID sent)
(SUN/MOON/SNOWFL. FLASHING)
(Only with FCU, HYD, CHC)

Occupancy mode display for Excel 20 to 600

Display of the currently active Excel 20 to 600 mode; further options depend on the configuration of the controller:

Occupancy mode
(SUN continuously ON)

Standby mode; generated by time program
(HALF-SUN continuously ON)

Unoccupancy mode
(MOON continuously ON)

To adapt the T7560 to the CARE control strategies for Excel 20 to 600, a standard ModAL software module is available. Contact your local Honeywell distributor, or refer to T7560A,B,C Installation Instructions (product literature no.: EN1B-0146GE51) for further details.

ACCESSORIES

For mounting the following accessories, please refer to the T7560A,B,C Installation Instructions (product literature no.: EN1B-0146GE51).

T7460-LONJACK

The T7460-LONJACK is a small board and allows easy access to LONWORKS via the wall module (the wall module must be already connected, in compliance with the max. cable lengths set forth by the LONWORKS Guidelines, to the LONWORKS network via a LONWORKS bus cable). Via an additional 3.5 mm jack plug on the board, a PC connection can be established.

Order quantity: set of 5 pieces

T7560 Blinds

Same material and color as housing; for covering non-operational buttons.
Order quantity: set of 50 pieces.

Honeywell

Manufactured for and on behalf of the Environmental and Combustion Controls Division of Honeywell Technologies Sàrl, Ecublens, Route du Bois 37, Switzerland by its Authorized Representative:

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Subject to change without notice. Printed in Germany
EN0B-0237GE51 R0508

C. Controller

Honeywell

XL40
CONTROLLER

INSTALLATION INSTRUCTIONS

EN1B-0231GE51 R0203

CONTENTS

VERSIONS

The XL40 controller family consists of four basic controller versions (the XL40A1, the XL40A1MMI, the XL40A2, and the XL40A2MMI) plus an extension board (the XF40A1), as well as two field-installable hardware accessories (the XL40A1 External MMI and the XD40L LONWORKS Module), all described in the following sections.

The XL40A1

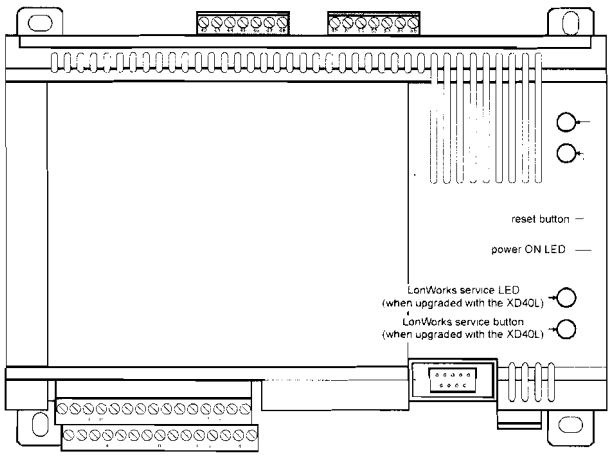

Fig. 1. The XL40A1

The XL40A1 (available in 10-piece bulk packages; order no.: XL40A1B10) features:

- six analog inputs, four analog outputs, and eight digital inputs all arranged in a single, low-voltage, double-decker terminal block located at the left side of the front of the housing (see Fig. 1), and also
- eight digital outputs (including two changeover relays and six normally-open relays) arranged in two digital output terminal blocks located at the rear of the housing.

The XL40A1 also features a reset button and power ON LED, both located on the top right of the housing.

The XL40A1 can be connected to a maximum of one XF40A1 expansion board (see section "The XF40A1 Expansion Board" on page 6).

The XL40A1 has no MMI, but can be connected to the XI40A1 External MMI (see section "The XL40A1 External MMI" on page 6) as well as accessed using the XI582AH or XI584AH (see "XI582AH / XI584AH Buswide Operator Interface", Product Literature No.: EN2B-0126GE51), if desired.

The XL40A1 can be upgraded with an XD40L LonWorks Module (see section "The XD40L LonWorks Module" on page 6) and thus made capable of LONWORKS communications. The corresponding openings for the LONWORKS service LED and LONWORKS service button are already present in the housing.

The XL40A1 is suitable for mounting in electrical cabinets (on either a DIN rail or a wall; see section "Mounting on the DIN Rail" or section "Mounting on the Wall" on page 7).

The XL40A1MMI

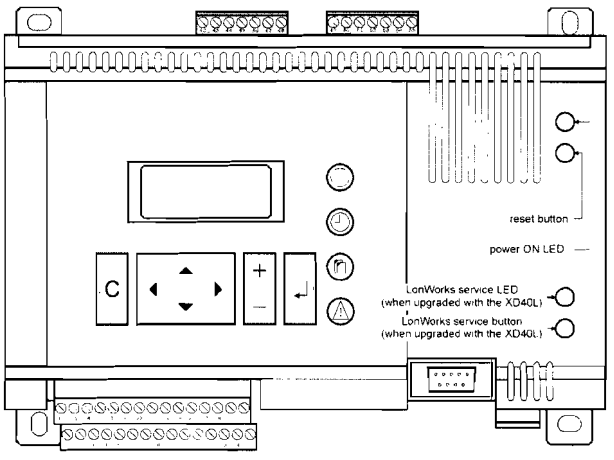

Fig. 2. The XL40A1MMI

The XL40A1MMI (available in 10-piece bulk packages; order no.: XL40A1MMIB10) features:

- six analog inputs, four analog outputs, and eight digital inputs all arranged in a single, low-voltage, double-decker terminal block located at the left side of the front of the housing (see Fig. 2), and also
- eight digital outputs (including two changeover relays and six normally-open relays) arranged in two digital output terminal blocks located at the rear of the housing.

The XL40A1MMI also features a reset button and power ON LED, both located on the top right of the housing.

The XL40A1MMI can be connected to a maximum of one XF40A1 expansion board (see section "The XF40A1 Expansion Board" on page 6).

The XL40A1MMI is equipped with an MMI, but can also be accessed using the XI582AH or XI584AH (see "XI582AH / XI584AH Buswide Operator Interface", Product Literature No.: EN2B-0126GE51), if desired.

The XL40A1MMI can be upgraded with an XD40L LonWorks Module (see section "The XD40L LonWorks Module" on page 6) and thus made capable of LONWORKS communications. The corresponding openings for the LONWORKS service LED and LONWORKS service button are already present in the housing.

The XL40A1MMI is suitable for mounting in electrical cabinets (on either a DIN rail or a wall; see section "Mounting on the DIN Rail" or section "Mounting on the Wall" on page 7).

The XL402

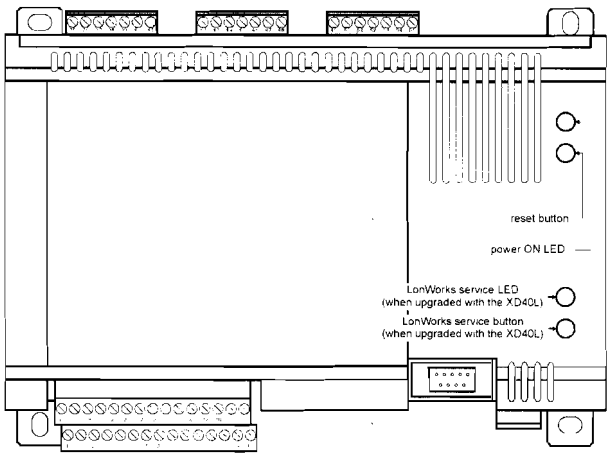

Fig. 3. The XL40A2

The XL40A2 (available in 10-piece bulk packages; order no.: XL40A2B10) features:

- eight analog inputs, four analog outputs, and fourteen digital inputs all arranged in a single, low-voltage, double-decker terminal block located at the left side of the front of the housing (see Fig. 3), and also
- twelve digital outputs (including three changeover relays and nine normally-open relays) arranged in three digital output terminal blocks located at the rear of the housing.

The XL40A2 also features a reset button and power ON LED, both located on the top right of the housing.

The XL40A2 can be connected to a maximum of one XF40A1 expansion board (see section "The XF40A1 Expansion Board" on page 6).

The XL40A2 has no MMI, but can be connected to the XI40A1 External MMI (see section "The XL40A1 External MMI" on page 6) as well as accessed using the XI582AH or XI584AH (see "XI582AH / XI584AH Buswide Operator Interface", Product Literature No.: EN2B-0126GE51), if desired.

The XL40A2 can be upgraded with an XD40L LonWorks Module (see section "The XD40L LonWorks Module" on page 6) and thus made capable of LONWORKS communications. The corresponding openings for the LONWORKS service LED and LONWORKS service button are already present in the housing.

The XL40A2 is suitable for mounting in electrical cabinets (on either a DIN rail or a wall; see section."Mounting on the DIN Rail" or section "Mounting on the Wall" on page 7).

The XL40A2MMI

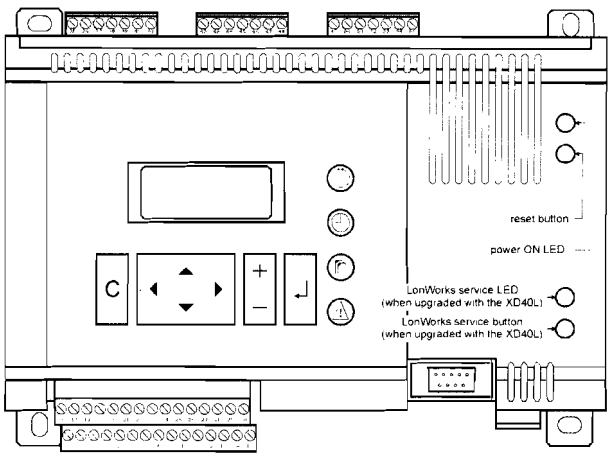

Fig. 4. The XL40A2MMI

The XL40A2MMI (available in 10-piece bulk packages; order no.: XL40A2MMIB10) features:

- eight analog inputs, four analog outputs, and fourteen digital inputs all arranged in a single, low-voltage, double-decker terminal block located at the left side of the front of the housing (see Fig. 4), and also
- twelve digital outputs (including three changeover relays and nine normally-open relays) arranged in three digital output terminal blocks located at the rear of the housing.

The XL40A2MMI also features a reset button and power ON LED, both located on the top right of the housing.

The XL40A2MMI can be connected to a maximum of one XF40A1 expansion board (see section "The XF40A1 Expansion Board" on page 6).

The XL40A2MMI is equipped with an MMI, but can also be accessed using the XI582AH or XI584AH (see "XI582AH / XI584AH Buswide Operator Interface", Product Literature No.: EN2B-0126GE51), if desired.

The XL40A2MMI can be upgraded with an XD40L LonWorks Module (see section "The XD40L LonWorks Module" on page 6) and thus made capable of LONWORKS communications. The corresponding openings for the LONWORKS service LED and LONWORKS service button are already present in the housing.

The XL40A2MMI is suitable for mounting in electrical cabinets (on either a DIN rail or a wall; see section "Mounting on the DIN Rail" or section "Mounting on the Wall" on page 7).

The XF40A1 Expansion Board

The XF40A1 (available in 10-piece bulk packages; order no.: XF40A1B10) features:

- eight analog inputs, four analog outputs, and fourteen digital inputs all arranged in a single, low-voltage, double-decker terminal block located at the left side of the front of the housing (see Fig. 4), and also
- twelve digital outputs (including three changeover relays and nine normally-open relays) arranged in three digital output terminal blocks located at the rear of the housing.

A maximum of one XF40A1 expansion board can be connected to each XL40 controller.

The XF40A1 has no MMI, nor can it be connected to the XI40A1 External MMI or accessed using the XI582AH or XI584AH; rather, it can be accessed only via the XL40 controller to which it is connected.

The XF40A1 cannot be upgraded with an XD40L LonWorks Module (see section "The XD40L LonWorks Module" on page 6); rather, in order to be made capable of LonWorks communication, the XL40 controller to which it is connected must be so upgraded.

The XF40A1 is suitable for mounting in electrical cabinets (on either a DIN rail or a wall; see section "Mounting on the DIN Rail" or section "Mounting on the Wall" on page 7).

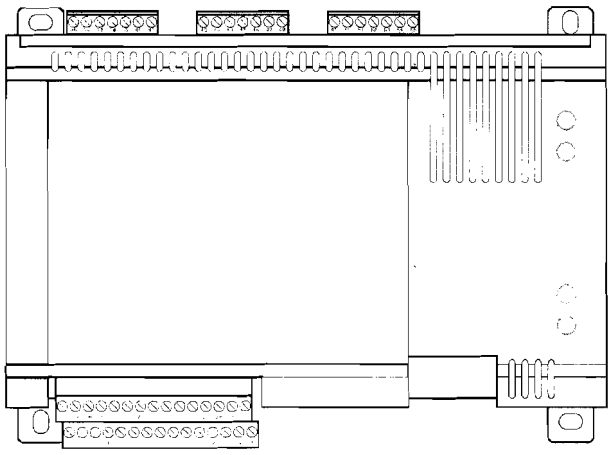

Fig. 5. The XF40A1

Accessories

Additionally, the XL40 controller family also includes the following two field-installable hardware accessories:

- the XL40A1 External MMI (see Fig. 6) and
- the XD40L LONWORKS Module (see Fig. 7).

The XL40A1 External MMI

The XI40A1 External MMI (available in 10-piece bulk packages; order no.: XI40A1B10) can be connected only to the XL40A1 and the XL40A2 controllers.

The XI40A1 External MMI is suitable for installation in cabinet doors (see section "Mounting the XI40A1 External MMI" on page 8).

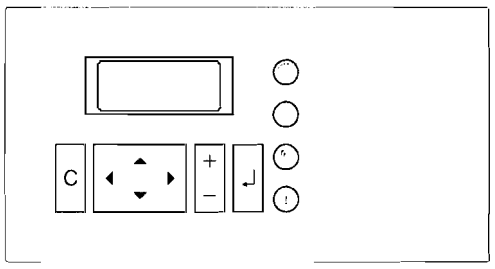

Fig. 6. The XL40A1 External MMI

The XD40L LonWorks Module

The XD40L LONWORKS Module (available in 10-piece bulk packages; order no.: XD40LB10) permits upgrading of XL40 controllers, thus making them capable of LONWORKS communication.

To install the XD40L LONWORKS module, the XL40 controller's housing must be opened (see section "Installing the XD40L LonWorks Module" on page 9).

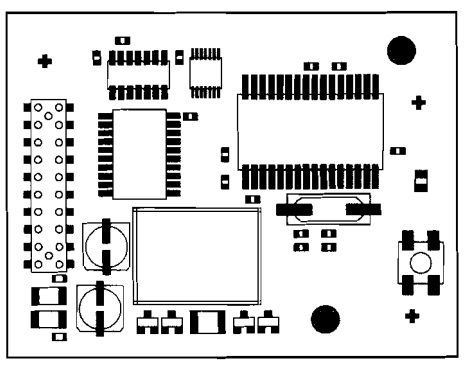

Fig. 7. The XD40L LonWorks Module

MOUNTING/CONNECTION

All four XL40 controller versions and the XF40A1 expansion board are suitable for mounting in electrical cabinets (on either the DIN rail or the wall).

To mount, proceed as described below.

Before Working

- When performing any work (installation, mounting, start-up), all instructions given by the manufacturer and in particular the safety instructions provided in these Installation Instructions are to be observed.
- The XL40 is to be installed and mounted only by authorized and trained personnel.
- If the unit is modified in any way, except by the manufacturer, all warranties concerning operation and safety are invalidated.
- Make sure that certain local standards and regulations are observed at all times. Examples of such regulations are VDE 0800 and VDE 0100.
- Use only accessory equipment coming from or approved by Honeywell.
- Before the system is dismantled, disconnect the power supply. Do this by unplugging the power supply terminal block connector or by installing an additional 3rd-party switch onto the DIN rail close to the XL40; see the following caution and note.

⚠ CAUTION

Disconnect the power supply before you begin installing the XL40 and/or upgrading it with the XD40L LonWorks Module and/or connecting the XF40A1 extension board. Do not reconnect the power supply until you have completed installation.

IMPORTANT

To comply with CE requirements, devices with a voltage in the range of 50 to 1000 Vac or 75 to 1500 Vdc which are not provided with a supply cord and a plug or with other means for disconnection from the supply having a contact separation of at least 3 mm in all poles, must have the means for disconnection incorporated in the fixed wiring.

Mounting on the DIN Rail in the Cabinet

The following instructions refer to the mounting of the XL40A1, the XL40A1MMI, the XL40A2, the XL40A2MMI, or the XF40A1 onto the DIN rail in an electrical cabinet.

To mount, proceed as follows:

1. Read the complete section "Before Working" carefully.
2. Wire and plug in the terminal blocks.
3. Attach the DIN rail mounting clips (available in 20-piece bulk packages; order no.: XL40ACC1) at the housing as is shown in Fig. 8.
4. Mount the controller on the DIN rail.

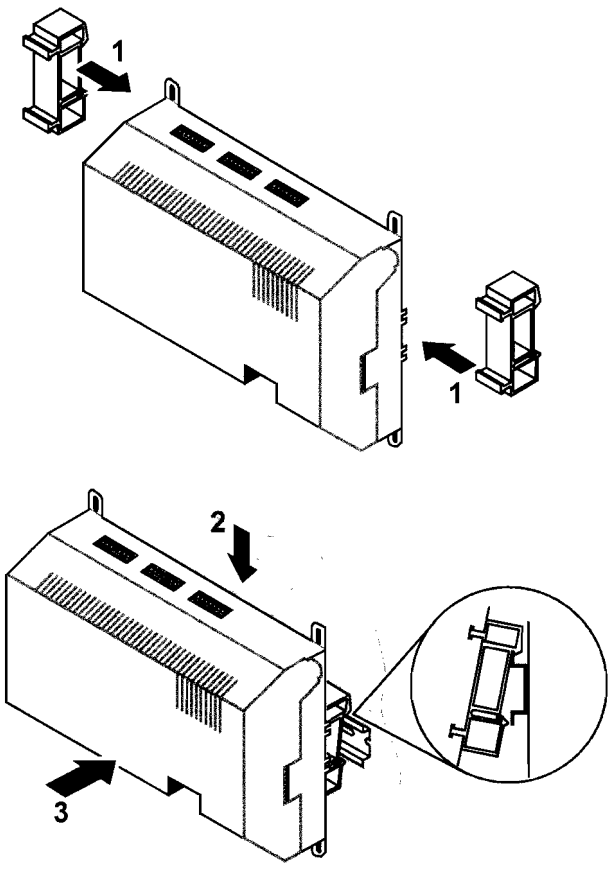

Fig. 8. Mounting on a DIN rail

Mounting on the Wall in the Cabinet

The following instructions refer to the mounting of the XL40A1, the XL40A1MMI, the XL40A2, the XL40A2MMI, or the XF40A1 onto the wall in an electrical cabinet:

To mount, proceed as follows:

1. Read the complete section "Before Working" carefully.
2. Drill screw-holes in the wall according to the template presented in Fig. 9.
3. Position the controller and screw in the screws.
4. Wire and plug in the terminal blocks.

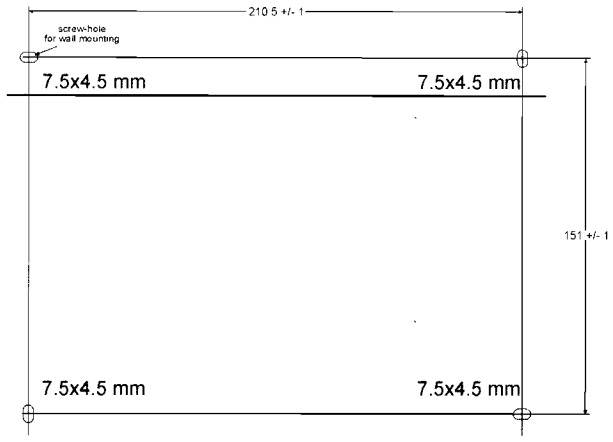

Fig. 9. Drilling template

Connecting the XF40A1

The following instructions refer to the connection of an already-mounted XF40A1 expansion board to an already-mounted XL40A1, XL40A1MMI, XL40A2, or XL40A2MMI:

The expansion board can be mounted either the right of (i.e. side-by-side installation) or below/above (i.e. vertical installation) the XL40 (see also Fig. 10).

In the case of side-by-side installation, the expansion board is connected to the controller using a 85-mm cable (10-piece set; bulk order no.: XW568B10); in the case of vertical installation, the XF40A1 is connected to the controller using a 350-mm cable (10-piece set; bulk order no.: XW578B10).

To connect, proceed as follows:

1. Read the complete section "Before Working" carefully.
2. Disconnect the controller's power supply.
3. Unplug the digital output terminal block connectors located at the rear of the controller and at the rear of the expansion board.
4. Raise the controller's and the expansion board's housing cover.
5. Remove the appropriate cut-outs in the controller's housing and in the expansion board's housing.
6. If the controller has been upgraded with the XD40 L LONWORKS Module, remove it.
7. Plug one end of the flat-strip cable into the controller's male box header (located to the right) and the other end into one of the expansion board's two male box headers (located at the right and left).
8. Replace, if necessary, the XD40L LONWORKS Module removed in step 6.

The XF40A1 expansion board draws its power from the XL40 via the flat-strip cable; the expansion board is thus powered by the same transformer as the XL40.

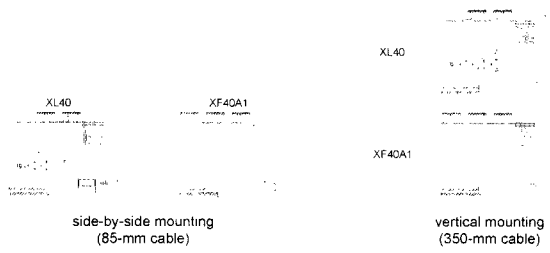

Fig. 10. Connecting the XF40A1 expansion board

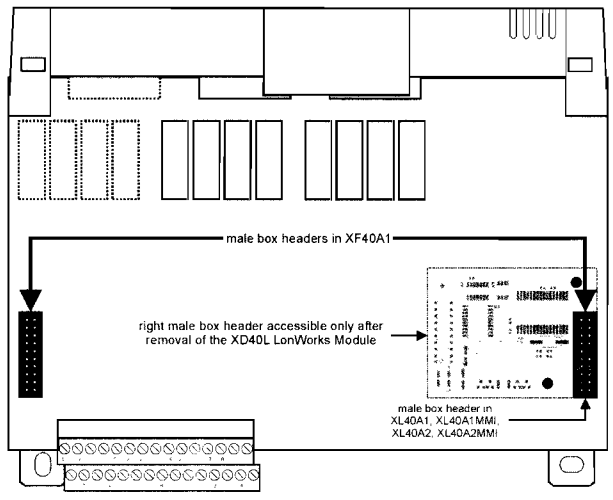

Fig. 11. Position of male box header(s) in the expansion board / four XL40 controllers (cover raised)

Mounting/Connecting Accessories

Mounting the XI40A1 External MMI

The XI40A1 External MMI is suitable for mounting in a cabinet door.

To mount, proceed as follows:

1. Read the complete section "Before Working" carefully.
2. Cut out a hole in the door according to the template presented in Fig. 12.
3. Attach the seal as shown in Fig. 13.
4. Insert the unit into the cut-out in the cabinet door.
5. Mount the springs in the three-step procedure as shown in Fig. 14.

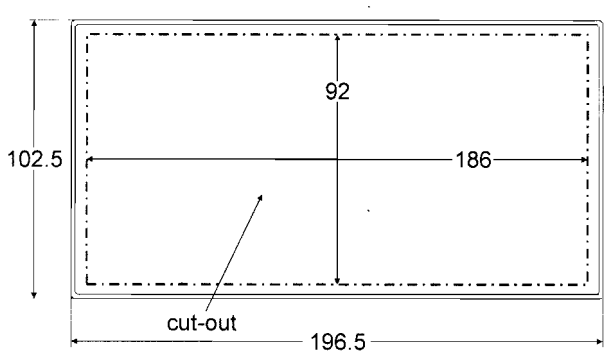

Fig. 12. Template for cut-out

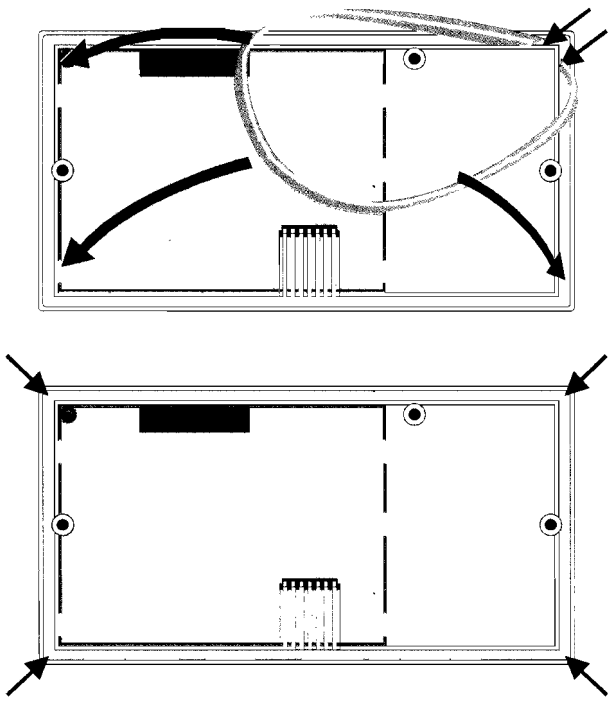

Fig. 13. Attaching the seal

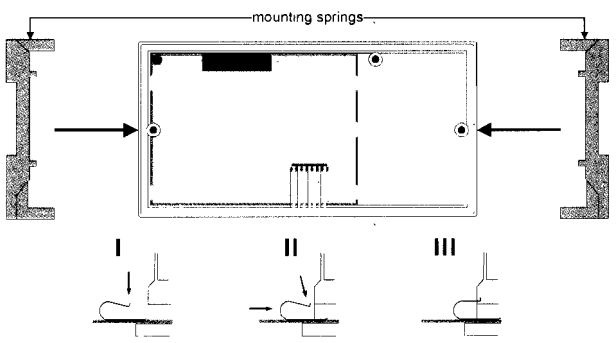

Fig. 14. Inserting the springs

Connecting the XI40A1 External MMI

The following instructions refer to the connection of an already mounted XI40A1 to an already-mounted XL40A1 or the XL40A2.

To connect, proceed as follows:

1. Read the complete section "Before Working" carefully.
2. Disconnect the controller's power supply.
3. Unplug the digital output terminal block connectors located at the rear of the controller.
4. Raise the controller's housing cover.
5. Plug the special 1.5-m flat-strip cable (10-piece set; bulk order no.: XW572B10) into the male box header of the controller and lead it out through the corresponding slot in the housing.
6. Plug the other end of the flat-strip cable into male box header of the XI40A1 External MMI.

Installing the XD40L LonWorks Module

The following instructions refer to the installation of the XI40A1 into any of the four XL40 controller versions.

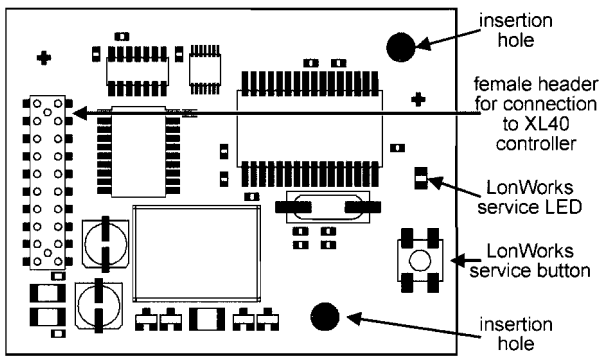

Fig. 15. XD40L LonWorks Module (details)

To install, proceed as follows:

1. Read the complete section "Before Working" carefully.
2. Disconnect the controller's power supply.
3. Unplug the digital output terminal block connectors located at the rear of the controller.
4. Raise the controller's housing cover.
5. Insert the two plastic mounting pedestals accompanying the XD40L LONWORKS module into the controller.
6. Position the insertion holes over the pedestals and plug in the XD40L LONWORKS Module, being careful to ensure that the pins located in the controller's male stacker fit snugly into the module's female header.

Cabling

Cable Routing

All signal cables (i.e. input/output and low-voltage cables) are communication circuits in accordance with VDE 0100, VDE 0800 and local regulations and should therefore be routed separately from line voltage.

Table 1. Minimum distances to line voltage

cable type	minimum distance
unshielded cable	4 in. (100 mm)
shielded cable	3/8 in. (10 mm)

IMPORTANT

Avoid joining sensor cables.

Shielding

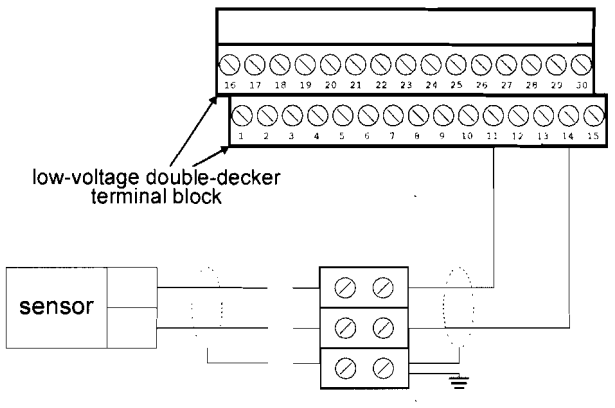

Fig. 16. Sensor shielding (example)

If the general guidelines on cable routing are observed (see "Cable Routing", page 9), the shielding of sensor and actuator cables with low safety voltages is not necessary. If these guidelines cannot be observed, cables must always be shielded. The shielded cables must be grounded as is shown in Fig. 16.

IMPORTANT

The shielding of I/O cables connected to peripherals such as sensors and actuators must be grounded at the control cabinet side, only; this is in order to avoid ground loops.

All Honeywell actuators are RFI suppressed in accordance with VDE 0871/B and VDE 0875/N.

Lightning Protection

Please check with your local Honeywell representative for information on lightning protection.

Cable Lengths and Cross-sectional Areas

Table 2. Signal types and cross-sectional areas

type of signal	cross-sectional area		
	≤ 300 ft (100 m)	≤ 550 ft (170 m)	≤ 1,300 ft (400 m)
power supply (24 Vac)	≤ 16 AWG (≥ 1.5 mm^2)	≤ 14 AWG (≥ 2.5 mm^2)	-
low-current signals*	≤ 20 AWG (≥ 0.5 mm^2)		
*E.g. for 0...10 V sensors, digital inputs, 0...10 V signals for actuators.			

IMPORTANT

The maximum length of a signal cable with 24 Vac supply is 550 ft (170 m). The maximum length of a two-wire, 0...10 Vdc signal cable is 1,300 ft (400 m). The secondary side of the transformer must not be connected to earth ground.

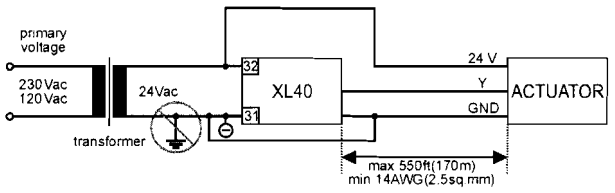

Fig. 17. Cabling of actuator with 24 Vac supply and max. 550 ft (170 m)

If the distance between the controller and actuator or sensor with 24 Vac supply is greater than 550 ft (170 m), a separate external transformer for the actuator or sensor is necessary.

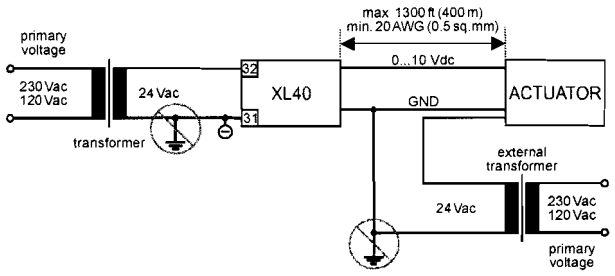

Fig. 18. Cabling of actuator with 24 Vac supply from external transformer and max. 1,300 ft (400 m)

IMPORTANT

We recommend installing a fuse on the secondary side of the transformer in order to protect the devices against miswiring.

Analog Inputs

Technical Description

The analog inputs convert data from passive sensors and active sensors with voltage output. The analog inputs can be used as current inputs for active sensors, but then an external resistor parallel to the sensor is necessary. It is also possible to feed digital signals to the analog inputs (see also section "Sensors and Transducers" on page 12).

Analog Input Ratings

All four XL40 controller versions and the XF40A1 expansion board feature analog inputs as listed in Table 3.

Table 3. Number of AI's and terminals (by version)

version	no. of AI's	no. of terminals
XL40A1	6	7
XL40A1MMI	6	7
XL40A2	8	9
XL40A2MMI	8	9
XF40A1	8	9

Each analog input is switchable by software to the input conditions listed in Table 4.

Table 4. Input conditions for switching analog inputs

NTC (20kΩ) / 0...10 V (low impedance)	-50...+150°C
0...20 mA (external 500 Ω resistor)	0...+10 V
slow digital inputs	dry contact

The XL40's analog inputs have an FIO (Field Input Output) cycle time of 1 second. Special application features ensure that critical control tasks (expansion valve control or special alarm functions) do not exceed a cycle time of 500 msec.

When equipped with an external 500 Ω resistor, the analog inputs can also be used to provide 0...20 mA current input.

IMPORTANT

The analog inputs are protected against short-circuit and over-voltage up to 24 Vac. If any input is sourced with more than 20 Vdc or with negative voltage, the other inputs will be influenced. This could result in incorrect values.

The input impedances are defined as followed:

- Input impedance (NTC / 0....10 V): 200kΩ to GND / 25kΩ to +10 V.
- Max. ratings (voltage): +20 V / -1 V.
- The analog inputs are not galvanically isolated.
- Resolution: 10 bit.

Table 5 and Table 6 provide information on the resolution of analog input sensors and on their accuracy, respectively.

- Accuracy of analog input voltage: 0...10 V / ± 200 mV.
- Accuracy of analog input current: 0...20 mA / ±1 mA (when equipped with external 500 Ω resistor).
- Sample time: 1 s.

Table 5. Resolution of AI sensors

range	resolution/step of A/D-converter (approx.)
-50...-20 °C	± 1.0 K
-20...0°C	± 0.2 K
0...30 °C	± 0.1 K
30...70 °C	± 0.3 K
70...100 °C	± 0.8 K
100...130 °C	± 2.0 K
130...150 °C	± 3.5 K

Table 6. Accuracy / deviation of AI sensors

range	deviation (±Kelvin, not including sensor tolerance)	
	hardware-specific deviation	software-specific deviation
-50...-40 °C	± 7.5 K	± 0.5 K
-40...-30 °C	± 4.0 K	± 0.4 K
-30...-20 °C	± 2.5 K	± 0.2 K
-20...-10 °C	± 1.5 K	± 0.1 K
-10...0 °C	± 1.0 K	± 0.1 K
0...10 °C	± 0.7 K	± 0.05 K
10...50 °C	± 0.5 K	± 0.05 K
50...70 °C	± 0.8 K	± 0.05 K
70...90 °C	± 1.3 K	± 0.1 K
90...100 °C	± 1.8 K	± 0.1 K
100...120 °C	± 3.4 K	± 0.3 K
120...150 °C	± 8.5 K	± 0.5 K
ambient temperature = 25°C		

Types of input signals:

NTC 20k Ω

0 to +10 V

0 (4) to 20 mA (with an external resistor of 499 Ω ±0.25% [see Fig. 20])

Regardless whether defined (during CARE engineering) as being connected to an NTC 20kΩ or to a voltage source, the inputs are always enabled (see section "Pull-Up Resistor Handling").

NTC 20kΩ:

Range -58 °F to +302 °F (-50 °C to +150 °C)

Voltage source:

Range 0...10 V

Passive sensors (NTC 20kΩ)

Room temperature sensor RF 20

Inlet temperature sensor VF 20A

External temperature sensor AF 20

Active sensors (0...10 V):

Duct Humidity Sensors H7011A1000 / H7012A1009

Active sensors (0 (4) to 20 mA):

Immersion temperature sensor VF 100

Air duct temperature sensor LF 100

Wind sensor:

Wind sensor WS21

Further connections:

Temperature sensor terminal TF26

Solar Sensor SAF 25

VMP Feedback Potentiometer

The characteristic curves for other sensors can be entered manually in the data-point description (see Excel 50 User Guide, EN2B-0137GE51).

Pull-Up Resistor Handling

NTC and Low-Impedance Sensors. Characteristic name: NTC. The internal pull-up resistor is always enabled.

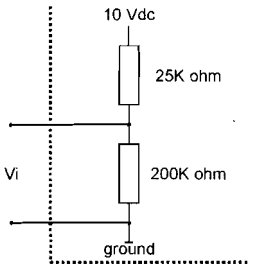

Fig. 19. Analog input / low-impedance sensors

Sensors and Transducers

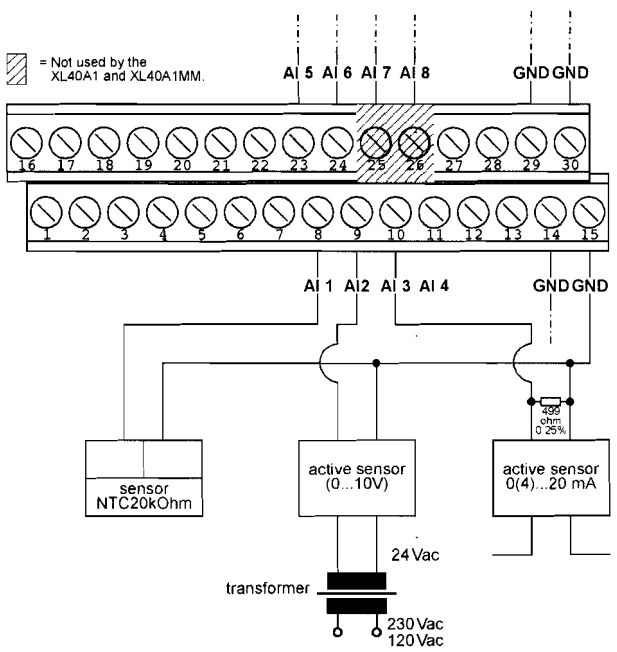

Fig. 20. AI's, sensor connections (example)

Analog Inputs Used as Digital Inputs

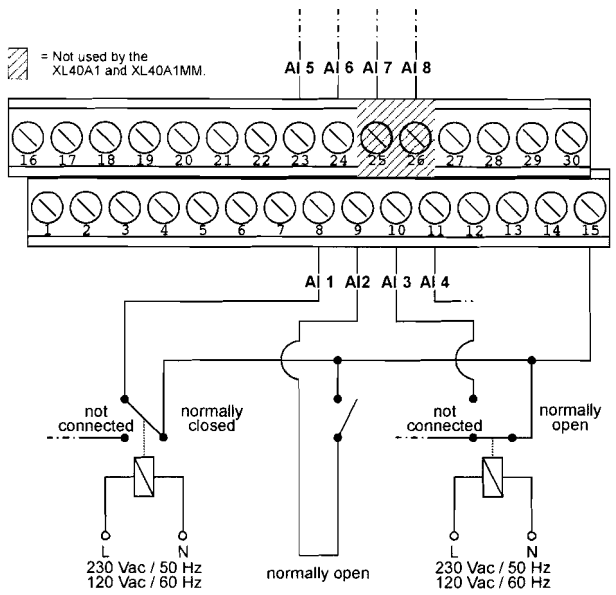

Fig. 21. AI's used as DI's (example)

For normally-open contacts, a digital signal must be switched via the changeover contact of an additional relay.

Unconnected analog inputs have a default voltage of 8.5 V. This is interpreted by the controller as a logical 1. This means that, in general, no external relay is needed for normally-open contacts.

IMPORTANT

The relay contact must be suitable for switching low voltage. For long cable distances, the analog input signal may be sensitive to interference. In this case, an external relay may also be used for normally closed contacts.

Digital Inputs

Technical Description

Digital Input Ratings

All four XL40 controller versions and the XF40A1 expansion board feature numerous digital inputs as listed in Table 7.

Table 7. Number of DI's and terminals (by version)

version	no. of DI's	no. of terminals
XL40A1	8	9
XL40A1MMI	8	9
XL40A2	14	15
XL40A2MMI	14	15
XF40A1	14	15

The digital inputs are not galvanically isolated.

24 Vac via dry contact. The XL40 supplies no special auxiliary voltage.

The digital inputs can be used only as status inputs, as alarms, or as slow totalizers.

Pulse times are specified in Table 8.

The XL40's digital inputs have an FIO (Field Input Output) cycle time of ≤ 250 msec. Special application features ensure that the critical control tasks (expansion valve control or special alarm functions) do not exceed a cycle time of 500 msec.

Table 8. Pulse times of digital inputs

kind of signal	special requirements	pulse time	pulse pause
potential-free contact (dry contact)	contact must be able to switch low voltages, max. bouncing time: 50 msec	≥ 300 msec	≥ 300 msec
AC voltage	none	≥ 300 msec	≥ 300 msec

Types of signals:

DC signal, max. 24 Vdc. The DC voltage switching thresholds of the digital inputs are:

- ON: 4.7...7.7 Vdc
- OFF: switching ON level -0.8...-3 Vdc (i.e. there is a hysteresis of between 0.8 and 3 V to switch back to OFF)

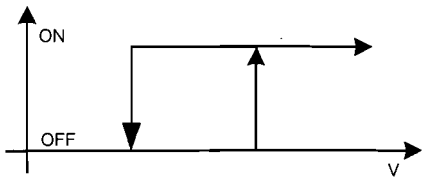

Fig. 22. DC voltage switching thresholds of digital inputs

- The minimum AC voltage switching threshold of the digital inputs is: 24 Vac -20%.
- Sample time: 250 msec.

Input resistance:

10k Ω

Parameter requirements:

If the digital inputs are used for normal digital or analog signals, the signals have to meet the static requirements stated in Table 9.

Table 9. Static parameters of digital inputs

contact position	NO/NC attribute	logical status
open	NO	0
closed	NO	1
open	NC	1
closed	NC	0

Connection Examples

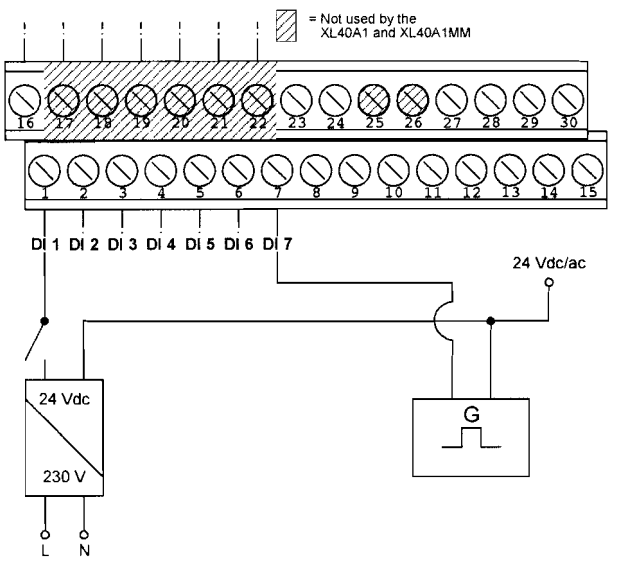

Fig. 23. DI's, sensor connections (example)

Analog Outputs

Technical Description

Analog outputs can be used, for example, to operate valve or damper actuators. The characteristic curves for these actuators can be defined via MMI (see Excel 50 User Guide).

Each analog output can also be used as a digital output.

Technical Specification

Analog Output Ratings

All four XL40 controller versions and the XF40A1 expansion board feature four analog outputs as listed in Table 10.

Table 10. Number of AO's and terminals (by version)

version	no. of AO's	no. of terminals
XL40A1	4	5
XL40A1MMI	4	5
XL40A2	4	5
XL40A2MMI	4	5
XF40A1	4	5

The XL40's analog outputs have an FIO (**F**ield **I**nput **O**utput) cycle time of 1 second. Special application features ensure that the critical control tasks (expansion valve control or special alarm functions) do not exceed a cycle time of 500 msec.

- Output voltage: 0...10 V (max. 11 V) or 2...10 V.

The analog outputs are not galvanically separated.

- Max. output current (sink/source): -0.5 mA / +1 mA.
- Resolution: 8 bit.
- Accuracy: ±150 mV + ±1 LSB (**L**east **S**ignificant **B**it)
- Zero-point: ±150 mV + ±1 LSB.
- Min. voltage step (LSB): 0.043 V.

The outputs are protected against over-voltage up to 24 Vac.

- Reset / watchdog position: 0%.
- Refresh cycle: 1 second.

Digital Outputs

Technical Description

The digital outputs are switched by a relay which can be connected directly to an external load.

Technical Specification

Digital Output Ratings

All four XL40 controller versions and the XF40A1 expansion board feature digital outputs – functioning as changeover relays (CO's) and normally-open relays (NO's) – as listed in Table 11.

Table 11. Number of DO's and terminals (by version)

version	no. of DO's		no. of terminals
	CO's	NO's	
XL40A1	2	6	14
XL40A1MMI	2	6	14
XL40A2	3	9	21
XL40A2MMI	3	9	21
XF40A1	3	9	21

The XL40's digital outputs have an FIO (Field Input Output) cycle time of ≤ 250 msec. Special application features ensure that the critical control tasks (expansion valve control or special alarm functions) do not exceed a cycle time of 500 msec.

- Output stage: relays (one CO per terminal block).
- Power failure position: inactive.
- Reset / watchdog position: inactive.
- Max. voltage: 230 Vac. The digital output terminals can switch 24 or 230 Vac or Vdc.

⚠ CAUTION

It is not allowed to mix the voltages on an digital output terminal block!

- Max. switch frequency:<2 Hz.
- Min. ON/OFF time ≥ 250 msec.
- Output strength: 2 A / 230 Vac (cos ϕ = 1.0).
- Total device (XL40): max. 12 A.
- Lifetime (electrical): 500000 cycles (2 A), the unit lifetime (as measured in the no. of switching cycles) increases when current < 2 A.
- Lifetime (mechanical): 30×10^6cycles.

The online point attribute "Normally Open / Normally Closed" (NO/NC) defines the relation between the physical state (relay on/off) and its logical status. See Table 12.

Table 12. Digital output parameters

relay ON/OFF	NO/NC attribute	logical status
On	NO	1
Off	NO	0
On	NC	0
Off	NC	1

Connection Examples

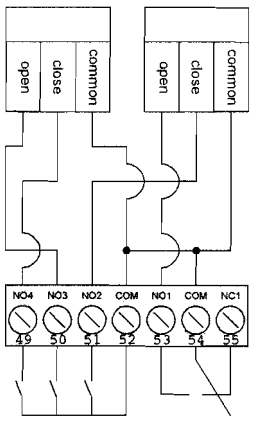

Fig. 24. DO's, direct connection of 3-position actuators (example)

Power Supply

The XL40 is powered by an external transformer. See also Fig. 26 on page 16.

Transformer requirements for one XL40:

Voltage 24 Vac ±20%
Power 15 VA, if fully equipped

If capable of providing sufficient power, the transformer, already installed in the cabinet, can be used to supply several controllers, communication devices, or peripherals (actuators, etc.).

CRT-Series

Table 13. No. of XL40 controllers (inc. XF40A1 expansion boards) connected to one transformer

transformer	no. of controllers
CRT 2	3
CRT 6	8
CRT 12	15

Use a quick-acting backup fuse 10 A (or automatic H16 or L16) to protect the transformer primary side. On the primary side of the CRT 2, there is a fusible output of type M 0.315 A (T) 250 V for the purpose of fine fusing.

Table 14. Overview of CRT Series AC/DC current

transformer	max. AC current	max. DC current
CRT 2	2 A	0.5 A = 500 mA
CRT 6	6 A	1.3 A = 1300 mA
CRT 12	12 A	2.5 A = 2500 mA

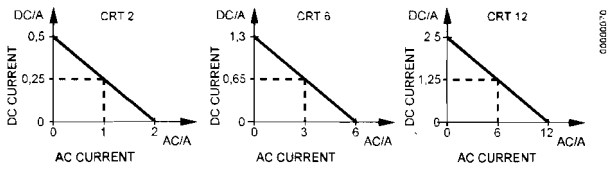

Fig. 25. AC/DC current graphs

1450 Series

All transformers of the 1450 series are designed for 50/60 Hz AC and have insulated accessory outputs. The transformers include built-in fuses, line transient/surge protection and AC convenience outlets and meet NEC class 2 requirements.

Table 15. 1450 Series transformers

part # 1450 7287	primary side	secondary side
-001	120 Vac	24 Vac, 50 VA
-002	120 Vac	2 × 24 Vac, 40 VA and 100 VA from separate transformer
-003	120 Vac	24 Vac, 100 VA and 24 Vdc 600 mA
-004	240/220 Vac	24 Vac, 50 VA
-005	240/220 Vac	2 × 24 Vac, 40 VA and 100 VA from separate transformer
-006	240/220 Vac	24 Vac, 100 VA and 24 Vdc, 600 mA

Standard Transformers

Standard commercially available transformers must fulfill the following specifications:

Table 16. Requirements for standard transformers

output voltage	impedance	AC current
24.5 Vac to 25.5 Vac	≤ 1.15 Ω	max. 2 A
24.5 Vac to 25.5 Vac	≤ 0.40 Ω	max. 6 A
24.5 Vac to 25.5 Vac	≤ 0.17 Ω	max. 12 A

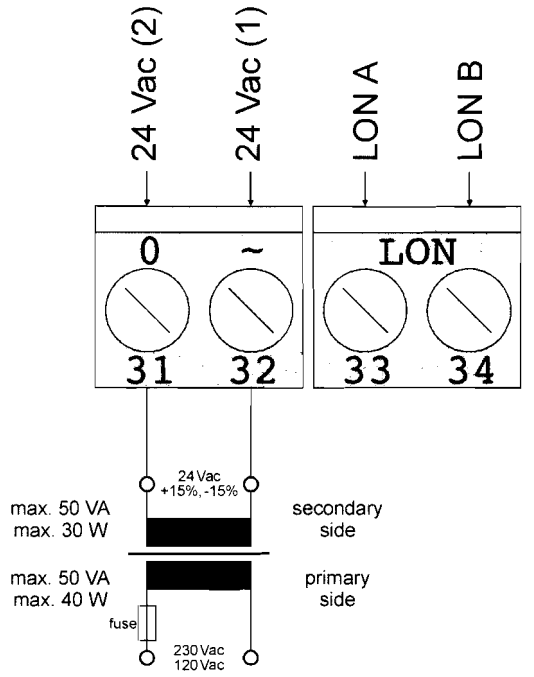

Fig. 26. Connecting the power supply

Adjusting the MMI Display Contrast

To install, proceed as follows:

1. Read the complete section "Before Working" carefully.
2. Without disconnecting the controller's power supply, unplug the digital output terminal block connectors located at the rear of the controller
3. Raise the controller's housing cover.
4. Using a slotted or cross-tip screwdriver, turn the potentiometer, thus adjusting the contrast to the desired level. A maximum of one half-turn is possible.

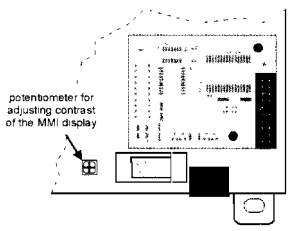

Fig. 27. Adjusting the display contrast

Honeywell

Automation and Control Solutions
Honeywell AG
Böblinger Straße 17
D-71101 Schönaich
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http://europe.hbc.honeywell.com

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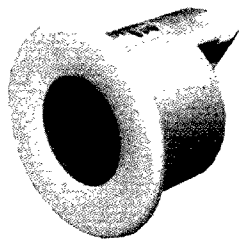
Manufacturing location certified to **DIN EN ISO 9001**

EN1B-0231GE51 R0203

D. Occupancy Sensor

Ceiling Mounted Occupancy Detector



Features

- Compatible with a broad range of equipment
- Flush or surface mount options
- Small loads can be switched directly without the need for interposing relays

Specification

Occupancy Sensor	Passive Infra-Red Detector
Field of view	360°
Coverage	7 metres max.
Type	Class 2I
Supply Voltage	12 - 24Vac/Vdc
Switching Capacity	240Vac @ 6(2)A
Electrical Connections	+24V, 0V, Relay - Common, NO, NC
Dimensions	See Page 2
Temperature	–10 to +40C
Humidity	90%RH non–condensing
Material	Flame retardant ABS, polypropylene
Conformity	EMC, LVD, CE Marked
Country of Origin	UK

Product Codes

OC-PIRC-LV
Low voltage ceiling mounting occupancy detector, flush mount

OC-PIRC-LV-S
Low voltage ceiling mounting occupancy detector, surface mount

Technical Overview

The OC-PIRC-LV is a Passive Infra-Red detector for monitoring occupation through moving body heat. Detection of occupancy causes the internal SPDT relay to activate.
The mains rated volt free contacts in the OC-PIRC-LV ensure compatibility with a vast array of equipment.

Installation

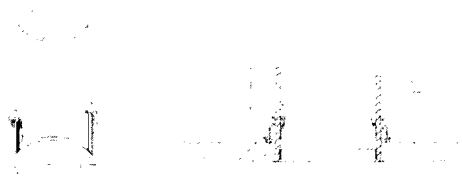
The OC-PIRC-LV should be sited so that the occupants of the room fall inside the detection pattern shown below and in accordance with the following guidelines.

- Avoid direct sunlight entering the sensor.
- Do not site within 1m of forced air heating or ventilation.
- Do not site within 1m of any lighting.
- Do not fix to a vibrating surface.

Fixing

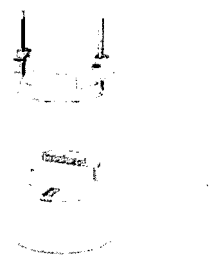
Flush Mounting
Flush mounting is achieved using the plastic bracket and clips provided.
Ensure that the ceiling tile is of suitable material to support the weight of the unit and that there is sufficient clearance above the ceiling. No access is required to the ceiling void, other than for wiring.

a/



65mm dia. hole should be cut if mounted this way.

b/



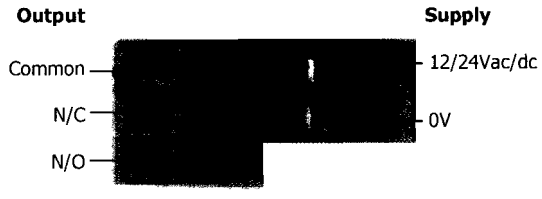
59mm dia hole should be cut if mounted this way.

Fixing (continued)

Surface Mounting
Surface mounting is effected using the optional surface back box. Side knockouts are provided for cable entry. Fixing lugs allow mounting to BESA boxes or metal boxes. Optional security screws can be fitted to prevent removal.

50 or 60mm fixing centres

Connections

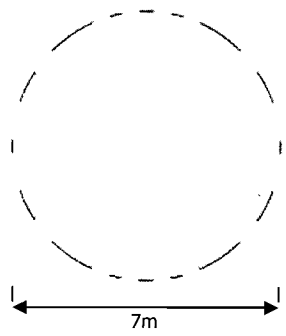


Setting Time Delay

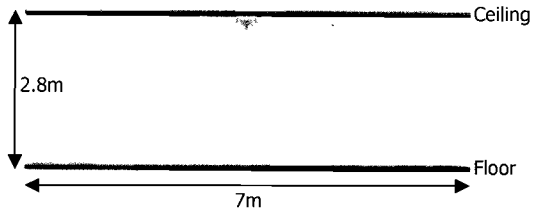
Timing is adjustable between 10s and 30min using the screwdriver slot labelled TIME.

Detector Patten

Top view:

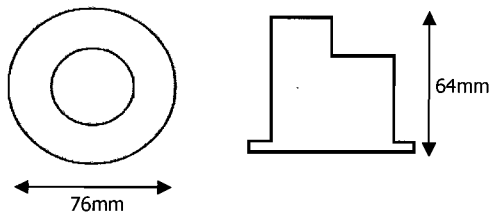


Side view:

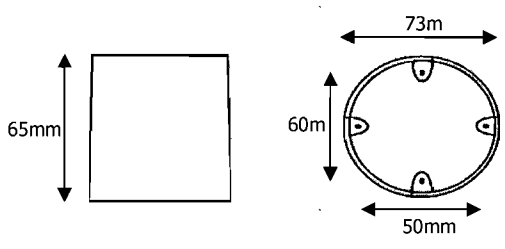


Dimensions

Main Housing:



Surface Back Box:



Flush Mounting Bracket: