

metacentre

EnergAir



Product Guide **2007/2008**



EnergAir equipment is used by users of compressed air all over the world. We are the leading Compressor Management System solution provider in Europe and have a growing market presence in the Americas and Asia.

We design, develop and test everything we make. Our guiding principle is to focus on the needs of the people that use our equipment, the need for functionality and effective solutions that provide a performance benefit. That's what EnergAir is all about.

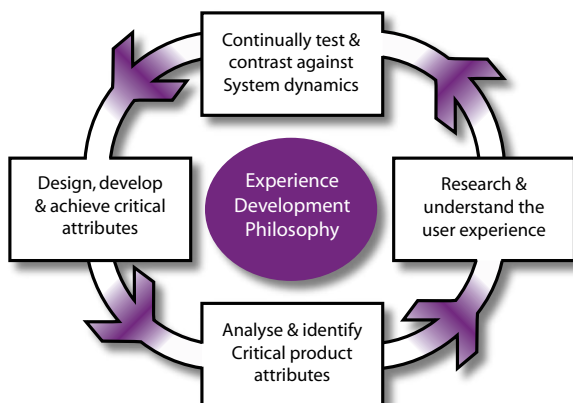
Innovation & Technology:

Every product we make is created through a method we've been developing and refining since EnergAir's formation. At EnergAir our Vision is to be the best Compressor Management System provider in the world. With that as our goal we pursue the 'Experience and Development' philosophy for everything we make.

It's a philosophy that first seeks to understand system dynamics, then we analyse the critical attributes that equipment must have, and then design specifically for those attributes. Finally, we test in both the lab and in real systems to measure success. Never happy with 'just good enough', we continually revise our products, components and software and processes with this Experience Development philosophy.

Design:

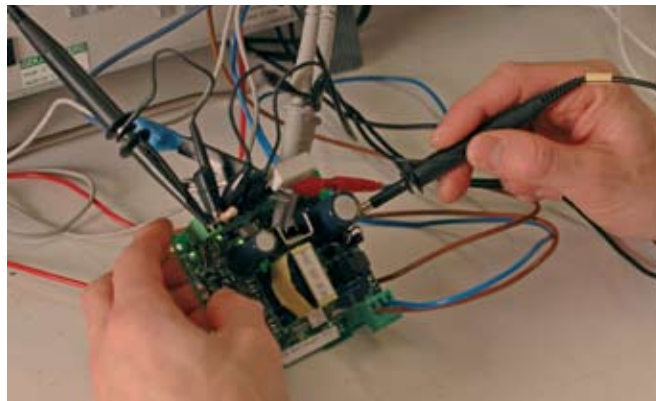
By altering hardware, software and components to achieve specific performance attributes, our designers and engineers work together to ensure that form and function are both developed together. From advanced software routines to simple relays and transformers, every project is approached with an eye towards design.



Materials:

Materials selection involves the consideration of not just the materials themselves, but also how and when we use them. For every application, we carefully select materials based on specific performance requirements.

Materials selection begins as a process that is integrated into the initial design stages, and then is continually revised to ensure that optimal materials selection is still being made through various design alterations.



Continual Performance Testing:

With continual feedback from our in-house application teams, designers, manufacturing staff, our partner network and face-to-face meetings with EnergAir users from around the world, EnergAir produces in our opinion, the worlds best Compressor Management Systems.



It's All About Results:

Innovation and technology have to produce results; the aim for our equipment is increased energy efficiency, improved equipment utilisation and better system integration.

This can mean shaving a few psi off your target system pressure, balancing system pressure with demand and deploying your air compressors more effectively, but the results will show on the bottom line in financial savings.

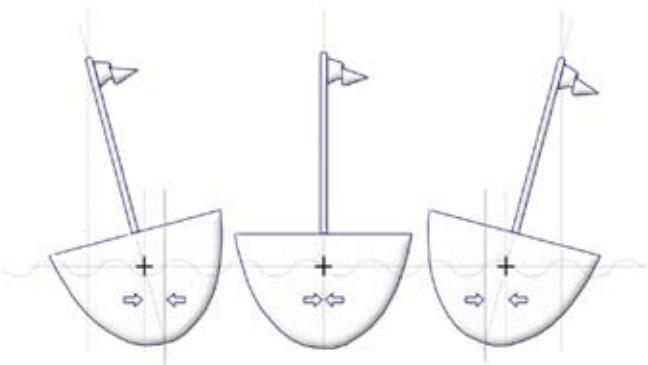
EnergAir products are about keeping compressed air under control.

EnergAir Partners:

We take pride in the quality of design and manufacture of every product we make. We also take pride in the quality of the before and after sales service offered by the partners who represent EnergAir around the world.

Metacentre:

What does it mean? 'Essentially the definition is about maintaining equilibrium, a centre line drawn through a floating or moving target.' For us, this illustrates finding the equilibrium between the constantly moving target of compressed air generation and demand.



So why do you need Metacentre:

Put simply – as demand for compressed air fluctuates and as system pressure decays or increases in response to that demand, Metacentre compressor management systems ensure that site wide compressors and ancillary compressed air equipment are harnessed as one to obtain an equilibrium where efficiency, equipment utilisation and system pressure are in perfect balance.

Maintaining that balance in a managed compressed air system represents a significant energy & cost saving opportunity. The more complex the compressed air system, the greater the opportunity for savings!

Technology in action:

At EnergyAir we don't just take 'off the shelf' technology to make our compressor management systems, we engineer, develop and test until we achieve optimal results. From a Metacentre XC unit to an iPCB we make the same painstaking commitment to material and software excellence. Computer aided design is backed by extensive lab testing and finally hour-after-hour of verification at the most demanding of system installations, all with one goal in mind - making the worlds best Compressor Management System.



Harness and control up to 24 site wide compressors of any make model or type.



One touch & single pressure band technology narrowing site wide pressure to a minimum of 0.2bar



Table Technology that allows configuration and inter-utilisation of up to 6 separate compressor management & control strategies.



Real time clock & pressure schedule adding necessary fine tuning and pressure optimisation capabilities.



Intelligent pre-fill for required system pressure, set when you want it and let Metacentre do the rest!



Energy Control Mode, our most advanced control algorithm for efficient compressor system management & control.



Multiple VSD control and optimisation technology; keeping two or more variable speed compressors working in-synch with the system, and within their most efficient speed envelope requires intelligent control.



Start function, a system building feature that integrates the starting of ancillary equipment such as pumps and air treatment equipment.



Zone Control. When your compressors are distributed in multiple locations, you need a Management system that understands where they are and makes their function visible.



Remote pressure balance. When your distribution pipework causes pressure imbalance between Zones, Metacentre is designed & engineered to overcome this



Remote I/O expansion. As the system builds, add distributed intelligence to monitor equipment, sensors and automate functions.



Virtual relay automation technology brings all the benefits of 'PLC style' automation within a focused application environment.



For added peace of mind a back-up control pressure sensor can be added. Also allowing air treatment differential to be monitored. Lastly, if air flow monitoring is of interest, a flow sensor can be connected to a dedicated input on the Metacentre system.

Notes:



Choose your Metacentre – management controller:

S2	2	2		✓									
S3	3	2		✓									
S4	4	2		✓									
P4	4	2	3	✓	✓								
SX	12	2	4	✓	✓	✓	✓	✓					
XC	24	12	6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Pressure

S2, S3 & S4:



Designed with small compressor users in mind, Metacentre S Series management controllers deliver fine pressure control for up to 4 compressors in 1 compressor location. S Series compressor management controllers also feature RS485 communications as standard.



Part No	Description	More info
Y04ENER08.00	Metacentre S2	T39
Y07ENER20.00	Metacentre S3	T39
Y04ENER09.00	Metacentre S4	T39
Y04CM69.00	Kit, Metacentre, Installation	N/A

Make life easy, the installation kit ensures you have all the necessary components needed to install a Metacentre compressor management panel.



S2, S3 & S4 kits:



Metacentre S Series kits add the respective number of compressor interface PCB's and a control pressure sensor to the Metacentre S Series Management controller. An install kit is also supplied.

Part No	Description	More info
Y04ENER06.00	Kit Metacentre S2	T55
Y07ENER21.00	Kit Metacentre S3	T55
Y04ENER07.00	Kit Metacentre S4	T55

A number of ancillary kits are available to enhance the capabilities of S Series Management panels, details can be found by referring to the 'More info' fact sheet.

Part No	Description	More info
Y05CM39.00	Kit, 7 Day time clock (240v supply)	T70
Y05CM41.00	Kit, 7 Day time clock (110v supply)	T70
Y01ENER15.00	Kit, Manual override	T24
Y01ENER16.00	Kit, Alarm beacon	T23

P4:



Metacentre P4 adds 'Table technology', a real time clock and a pressure scheduler to the management controllers feature list. These features provide advanced fine tuning of the connected compressors, such as the ability to configure up to 3 independent control strategies; control strategies can then be selected using the Metacentre P4's real time clock and scheduler. The Metacentre P4 also features a menu configurative input and menu configurative output function.



Like S Series Management panels, Metacentre P4 is available for purchase on its own or as part of a kit (Kit includes Metacentre P4, 4 x iPCB's, control pressure sensor & install kit).

Part No	Description	More info
Y07ENER15.00	Kit, Metacentre P4	T55
Y07ENER05.00	Metacentre P4	T39
Y04CM69.00	Kit, Metacentre, Installation	N/A
Y01ENER15.00	Kit, Manual override	T24
Y01ENER16.00	Kit, Alarm beacon	T23
Y07ENER22.00	Kit, Service maintenance key switch	N/A

SX:



Metacentre SX is a 'full feature' Compressor management controller designed to connect up to 12 compressors in a single compressor location. As a full feature product, and in addition to the features available in Metacentre P4, Metacentre SX benefits from our advanced 'Energy control' software. 'Energy control' software allows the Management controller to distinguish between types of compressor (e.g. fixed speed, variable speed etc) and the sizes of available compressors (e.g. 50kW, 100kW etc). With this information and our advanced 'Energy control' software, Metacentre SX is able to follow an 'optimal energy' control strategy. 'Multi VSD control software', another feature of Metacentre SX uses a VSD compressors minimum, maximum, optimum and minimum optimum speeds (where available) to successfully harness and optimally control compressor systems where multiple VSD compressors are installed.



There is also a backlit graphic operator interface, while fascia mounted LEDs provide instant visual 'at distance' indication of compressor status and compressor management system status.

The Metacentre SX is available to purchase on its own or as part of a kit (Kit includes Metacentre SX, 4 x iPCB's, control pressure sensor & install kit).

Part No	Description	More info
Y07ENER16.00	Kit, Metacentre SX	T39
Y07ENER06.00	Metacentre SX	T39
Y04CM69.00	Kit, Metacentre, Installation	N/A
Y01ENER15.00	Kit, manual override	T24
Y01ENER16.00	Kit, Alarm beacon	T23
Y07ENER22.00	Kit, Service maintenance key switch	N/A

XC:



Metacentre XC is our flagship and most complete compressor management product. Metacentre XC carries all the features of Metacentre SX, but with an increased focus on big compressor systems & system building.



Systems with up to 24 compressors can be accommodated. As the potential for these compressors to be in a single location is less likely, we've added some unique software features to Metacentre XC.

Our 'Zone Control' feature helps to distribute compressors across multiple 'compressor zones' where distribution pipework can cause pressure drops between compressor locations. Metacentre XC's 'Pressure balance' feature will also allow you to take control pressure readings from multiple locations and optimise zoned compressor selection. We've added more tables too, increasing the number and variety of control strategies that can be configured.

Metacentre XC isn't just a big compressor management panel, its system building capability is considerable too.

There's a dedicated 'start function' enabling auxiliary equipment to be pre-started prior to utilisation of any compressors. There's a second 'back-up control pressure sensor' analogue input and further analogue inputs dedicated to 'air treatment differential' monitoring and 'air flow' monitoring. The Metacentre XC is equipped with 8 dedicated 'digital' inputs, each having a defined function. Metacentre XC is equipped with 4 remote digital inputs that can be used as 'input functions' for any virtual relay. The Metacentre XC is also equipped with 10 remote relay contact outputs, the function of which is determined by the set-up of the equivalent 'virtual relay'. As if all that wasn't enough, we've added the ability to add up to 12 additional I/O modules to the Metacentre XC, collectively providing the ability to automate, control and monitor almost anything. There are literally millions of configuration possibilities!

Part No	Description	More info
Y07ENER07.00	Metacentre XC	T39
Y04CM69.00	Kit, Metacentre, Installation	N/A
Y01ENER15.00	Kit, manual override	T24
Y01ENER16.00	Kit, Alarm beacon	T23
Y07ENER22.00	Kit, Service maintenance key switch	N/A

System building with Metacentre XC is just like using a PLC but with 1 significant advantage. All the hardware & software has already been engineered specifically for the application. All you've got to do is configure and go!

Vacuum

V4 & VX:

Metacentre P4 & SX is also available for Management control of Vacuum systems. The Metacentre V4 & VX Vacuum Management controllers share the same features and functions as the pressure variants, but utilise a Vacuum sensor and Vacuum control software. Offered in kit form, the V4 & VX kits include Metacentre V4 / VX, 4 x iPCB's, Vacuum sensor & install kit.



Part No	Description	More info
Y07ENER17.00	Kit, Metacentre V4	T39
Y07ENER19.00	Kit, Metacentre VX	T39
Y01ENER15.00	Kit, manual override	T24
Y01ENER16.00	Kit, Alarm beacon	T23
Y07ENER22.00	Kit, Service maintenance key switch	N/A

Kits:

Once you've chosen your preferred Metacentre management controller, we recommend that you select and order compressor management kits where available. Kits exist for Metacentre S, P, SX & Metacentre VX products.

Please note that the Metacentre SX & VX kits provide for the installation of up to 4 compressors only. Where more than 4 compressors are to be connected to a Metacentre SX or VX you will need to select additional compressor interface products. Please refer to the 'Compressor interface products' section of this document for more information on how to make your selection.

If you have selected a Metacentre XC, or if a kit alone cannot satisfy your total system requirements then please proceed to the next step in building your system; 'Compressor interface products'.

Cable:

Metacentre kit selection made? You just need interconnecting cable to complete your system!



Now choose your compressor interface products:

A variety of compressor interface products are available, all engineered to handle specific compressor and compressor system interfacing needs. Why? Simply because the variety of compressor brands, products and control types along with the variety of system installations we see around the world requires us to have a variety of solutions to match. Those products allow us to harness and optimally control even the most demanding of site-wide compressor systems. It's what separates Metacentre from an old style compressor sequencer.

Whether you've got a straight forward load / unload group of fixed speed compressors in one location or a variety of fixed speed, variable speed or variable output compressors spread across multiple locations; you'll find a product here to suit.

Compressors supporting the 'Multi485' protocol:



Not all compressors need an interface product. Where a compressor has an RS485 port supporting the 'Multi485' protocol then this compressor can simply connect the data port to a Metacentre management controller. Please refer to EnergyAir for verification that a compressor supports the 'Multi485' protocol.

iPCB:

iPCB has been designed as a 'universal' compressor interface unit used to hardwire compressors to a Metacentre management controller. iPCB's are terminated directly at the Metacentre (except XC) or indirectly at an available 'direct connect', hardwire, 'iPCB' interface terminal (e.g. a terminal located on a local or remote interface module). Compact and retained within our rugged XPM DIN rail housing for mounting inside the compressor starter assembly, the iPCB provides a run, ready and optional alarm status contact for use with compressors that have some form of load / unload control. Each iPCB carries a dedicated 'service maintenance switch terminal' that allows you to easily remove a compressor from management control (e.g. for service) without creating nuisance alarms as a consequence of its removal. iPCB also features a variety of useful diagnostic LED's.



iPCB's are provided as part of Metacentre S, P & SX kits and can be purchased individually as required.

Part No	Description	More info
Y04CM59.00	Card, Metacentre, iPCB	T69
Y07ENER22.00	Kit, Service maintenance key switch	N/A

iX module (Metacentre SX & XC only):

The Metacentre SX is equipped with 4 'direct connect', hardwire 'iPCB' interface terminals. The Metacentre XC is not equipped with any direct 'connect' hardwire, 'iPCB', interface terminals.

Direct connect', hardwire 'iPCB's can be connected to Metacentre locally by adding iX modules. Each iX module adds 4 'direct connect', hardwire, iPCB interface terminals and can be located up to 10 metres from the Metacentre.



Up to two iX modules can be added

to a Metacentre SX and up to three can be added to Metacentre XC.

Part No	Description	More info
Y07ENER08.00	Metacentre iX interface module	T77
Y04CM59.00	Card, Metacentre, iPCB	T69
Y07ENER22.00	Kit, Service maintenance key switch	N/A

EX module (Metacentre XC only):

Where more than 1 compressor location exists, remote distributed intelligence can be added to harness control of a remote compressor or group of remote compressors. EX modules are placed adjacent to the remote compressor or group of compressors. Each module provides 2 'direct connect', hardwire, iPCB interface terminals for use with up to 2 remote compressors. In addition, each EX module has a dedicated 'remote system pressure' analogue input. This input can be configured to function in conjunction with Metacentre XC's advanced 'Pressure balance' software. 2 further dedicated analogue inputs for individual compressor discharge pressure are provided and a number of configurative options for use of all 3 pressure sensors are provided in software and configured from the EX modules operator interface. Additional dedicated and configurative auxiliary inputs and outputs are provided to support any further system integration requirements.



Part No	Description	More info
Y07ENER11.00	Metacentre EX interface module	T78
Y04CM59.00	Card, Metacentre, iPCB	T69
Y07ENER22.00	Kit, Service maintenance key switch	N/A
Y01ENER16.00	Kit, Metacentre Alarm Beacon	T23

DX module (Metacentre SX & XC):

Like EX, the DX module provides 2 'direct connect', hardwire, iPCB interface terminals. DX modules also offers the same analogue input and digital input / output capabilities as EX (Note however that the 'remote system pressure' analogue input will only function in conjunction with Metacentre XC) .



Additionally, the DX module is designed specifically to 'group' two compressors together as a single coherent unit. The DX module is able to manipulate two identical capacity compressors to form a single 'group' that will

act in an identical manner as a single 3-step (0% - 50% - 100%) compressor. The DX module is also able to manipulate 2 different capacity compressors providing demand matched control and sequence to form a single 'group' that will act in an identical manner as a variable stepping output, compressor. This feature provides the ability to:

- Group 2 adjacent air compressors together as a single coherent unit.
- Combine two similar capacity compressors together to form a three-step variable output group acting as a single coherent variable output unit.
- Take advantage of a smaller or minimal capacity compressor, grouped together with a medium or higher capacity compressor, to form a high capacity, variable output 'top-up' compressor.
- Increase the maximum compressor control capability of a Metacentre XC management unit by combining compressors together as one.

Part No	Description	More info
Y07ENER10.00	Metacentre DX interface module	T79
Y04CM59.00	Card, Metacentre, iPCB	T69
Y07ENER22.00	Kit, Service maintenance key switch	N/A
Y01ENER16.00	Kit, Metacentre Alarm Beacon	T23

VSD module 'mA & Vo' (Metacentre SX & XC):

The VSD module is intended to provide a method of system integration for variable speed drive air compressors that are not equipped with any inherently available or accessible means of remote connectivity or control. In conjunction with an optional 'speed monitoring kit' the VSD module will provide all the required functionality to enable total synergy with the energy control, and VSD compressor aware - functions of the Metacentre management controller.



A VSD module can also be used to provide a method of integration for non-variable speed type (e.g. fixed speed) air compressor that are not equipped with any inherently available or accessible means of system connectivity.

How? All air compressors are equipped with a method of sensing pressure, the VSD module monitors the compressors pressure sensor value and simulates the pressure sensor signal as an output. The VSD module uses this method to modify the pressure signal and manipulate the behaviour of the air compressor. In effect, the VSD module becomes a virtual air compressor pressure sensor.

Using the same method, the VSD module can also become an internal compressor pressure sensor ensuring that compressor equipment condition (i.e. separator element condition) and status is reported correctly. The VSD module is offered in 2 variants and for use with either 4-20mA pressure sensing or 0-5volt voltage pressure sensing technologies.

The VSD module monitors compressor status and continuously reports status information to the Metacentre management controller. The VSD module is equipped with a dedicated auxiliary compressor alarm input, an auxiliary compressor trip input and 2 dedicated relay outputs for compressor running and alarm condition.

Part No	Description	More info
Y05ENER02.00	Kit, Metacentre VSD mA interface module	T49
Y07ENER02.00	Kit, Metacentre VSD Vo interface module	T49
Y02CM14.00	Kit, Card, VSD output monitoring (25, 50, 100amp)	T50
Y02CM13.00	Kit, Card, VSD output monitoring (200, 400, 600amp)	T50
Y04CM59.00	Card, Metacentre, iPCB	T69
Y07ENER22.00	Kit, Service maintenance key switch	N/A
Y01ENER16.00	Kit, Metacentre Alarm Beacon	T23

CX module (Metacentre SX & XC):

Our CX module is intended for harnessing and optimally controlling the most demanding of variable flow compressors (such as 'spiral valve' and '3 or 4 way poppet valve' delivery manifold regulation systems) and 3 (0% - 50% - 100%) or 5 (0% - 25% - 50% - 75% - 100%) step piston compressors.

The CX module can also be used to control fixed speed and variable speed compressors as described earlier. Where necessary, the CX module can therefore be used as a replacement compressor controller.



An optional CX module - auxiliary I/O module can be added which provides additional compressor dedicated inputs and outputs with alarm and shutdown limits. The auxiliary I/O module provides 8 digital inputs, 4 analogue inputs and 4 relay outputs all available on a network for remote monitoring.

Part No	Description	More info
Y07ENER09.00	Metacentre CX interface module	T80
Y07ENER12.00	Metacentre CX interface module - auxiliary I/O	T80
Y04CM59.00	Card, Metacentre, iPCB	T69
Y07ENER22.00	Kit, Service maintenance key switch	N/A
Y01ENER16.00	Kit, Metacentre Alarm Beacon	T23

Ancillary products - Compressor gateways:

Compressor gateways provide a means of communication between 2 different protocols; Multi485 on the one hand and an equipment specific protocol on the other.



Part No	Description	More info
Y03CM53.00	Gateway, Nirvana compressor interface	T60
Y04CM47.00	Gateway, Vacon inverter controlled compressor interface	N/A

Ancillary products - Enclosures:

Metacentre general purpose boxes are useful enclosures when carrying out management system installations.



For example, where a compressor starter enclosure is inaccessible and an iPCB is to be mounted externally to the compressor, Metacentre general purpose boxes are ideal. 2 variants exist:

Y06ENER01.00 is a general purpose box complete with 2 DIN rails mounted inside the enclosure and a single DIN rail mounted on the back of the front door. A selectable 115v / 240v AC to 2 x 24Vac (2 x 25VA) power supply PCB is also mounted internally with all safety earth cabling fitted and secured.

Y06ENER02.00 is identical to the above but does not include the power supply unit.

Part No	Description	More info
Y06ENER01.00	Metacentre general purpose Box, c/w PSU	N/A
Y06ENER02.00	Metacentre general purpose Box, w/o PSU	N/A

Ancillary products - RS485 upgrade cards:

All Metacentre products feature RS485 communication as standard. For new systems, it is therefore no longer necessary to buy RS485 upgrade cards as an option. For existing products in the field you may still need to buy an RS485 card as an upgrade option.

Part No	Description	More info
97CM19.P0	Card, RS 485 communication PCB (Airmaster M6)	T12
97CM18.P0	Card, RS 485 communication PCB (Airmaster M5)	T12

Ancillary products - Power supplies:

Module, 24v–28v DC (adjustable) power supplies for DIN rail mounting with connectors.



Part No	Description	More info
Y02CM18.00	Module, 24V to 28V DC, 30W (adjustable) power supply for DIN rail with connectors	T52
Y07CM42.00	Module, 24V to 28V DC, 80W (adjustable) power supply for DIN rail with connectors	T52

Ancillary products – Relays, timers, signal repeaters:

The following relays and timers are commonly used when interfacing with some compressor types. The signal repeater provides a repeated and isolated 4-20mA signal.

Part No	Description	More info
Y07ENER04.00	Timer, multi function	T74
Y05CM49.00	Signal isolator / repeater, 4-20mA	T71
Y01ENER34.00	Relay, 24v DC	T26
Y01ENER35.00	Relay, 24v AC	T26
Y01ENER36.00	Relay, 110v AC	T26
Y01ENER37.00	Relay, 230v AC	T26

With a Metacentre management panel and all interfacing products selected, you're now ready to connect everything together!

Notes:

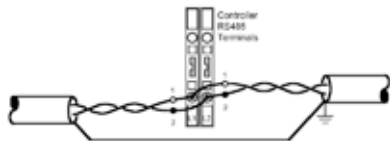
Interconnect your Metacentre equipment:

Interconnecting cable:

In general, 2 types of cable are used when interconnecting Metacentre equipment; data cable and signal cable.

Data cable:

Data cable is used to establish a 'common' RS485 network between each item of Metacentre hardware. RS485 is a proven industrial standard communication method of integrating distributed controllers, which may be some distance from each other, in a reliable and cost effective manner. Each controller is assigned a unique address number and is able to send or receive messages from any other controller in the system by using address identification.



Unarmoured 0.5mm², twisted pair (i.e. 2 cores), earth screened, DIN 47100 cable for RS485 data networking.



Armoured 0.5mm², SWA, twisted pair (i.e. 2 cores), earth screened, BS5302 Pt 2 cable



Signal cable:

Signal cable is used to interconnect sensors, iPCB's and any other equipment that connects to a Metacentre product directly from the terminal of the device to the terminal of the respective Metacentre product.



0.5mm², 0.75mm² to 1.0mm² 4 or 6 core, earth screened cable and data cable can be used as signal cable.

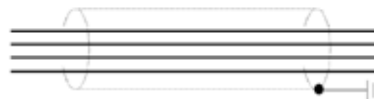
Unarmoured 0.5mm², twisted pair (i.e. 2 cores), earth screened, DIN 47100 cable for RS485 data networking.



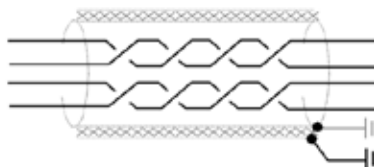
Armoured 0.5mm², SWA, twisted pair (i.e. 2 cores), earth screened, BS5302 Pt 2 cable for RS485 data networking.



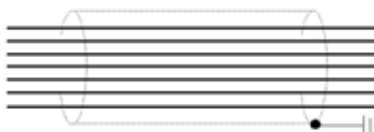
Unarmoured 0.5mm², 4 core, earth screened, DIN 47100 signal cable.



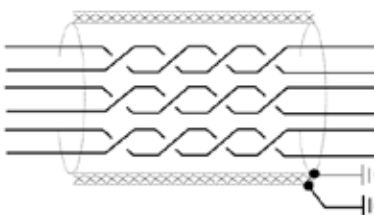
Armoured 0.5mm², SWA, 2 x twisted pair (i.e. 2 x 2 cores), earth screened, BS5302 Pt 2 cable.



Unarmoured 0.75mm², 6 core & earth (earth can be used as a 7th core), earth screened, DIN 47100 signal cable.



Armoured 0.5mm², SWA, 3 x twisted pair (i.e. 3 x 2 cores), earth screened, BS5302 Pt 2 cable.



Part No	Description
ALL CABLE IS PRICED & SUPPLIED IN 100M LENGTHS	
Y00ENER12.00	Unarmoured 0.5mm ² , twisted pair (i.e. 2 cores), earth screened, DIN 47100 cable for RS485 data networking.
Y07CM63.00	Armoured 0.5mm ² , SWA, twisted pair (i.e. 2 cores), earth screened, BS5302 Pt 2 cable for RS485 data networking.
Y07CMA3.00	Unarmoured 0.5mm ² , 4 core, earth screened, DIN 47100 signal cable.
Y07CM64.00	Armoured 0.5mm ² , SWA, 2 x twisted pair (i.e. 2 x 2 cores), earth screened, BS5302 Pt 2 cable
Y00ENER11.00	Unarmoured 0.75mm ² , 6 core & earth (earth can be used as a 7th core), earth screened, DIN 47100 signal cable.
Y07CM65.00	Armoured 0.5mm ² , SWA, 3 x twisted pair (i.e. 3 x 2 cores), earth screened, BS5302 Pt 2 cable.

COMMONLY USED CABLES HAVE BEEN HIGHLIGHTED



Wireless data networking:

When establishing an RS485 data network between Metacentre equipment, physical obstructions or practical complications can occur, making a 'fully wired' RS485 data network difficult to establish. For example, the Metacentre equipment is spread across 2 separate locations, 500 metres apart (e.g. 2 compressor locations) and a building lies between the locations. In such circumstances a wireless data network can be established.

Serial radio modem:

Metacentre RX serial radio modems are short range radio devices that output 500mW @ 869.525MHz (License Free EN-300-220/1). Metacentre RX serial radio modems should be used in conjunction with a serial radio antenna (detailed below). Together, they can transfer RS485 data between 2 wireless data transmission points. As a minimum, to establish a wireless radio network, you will need 2 Metacentre RX serial radio modems and suitable antenna (to establish communication between 2 data transmission points). Further Metacentre RX serial radio modems and antenna can be added as necessary.

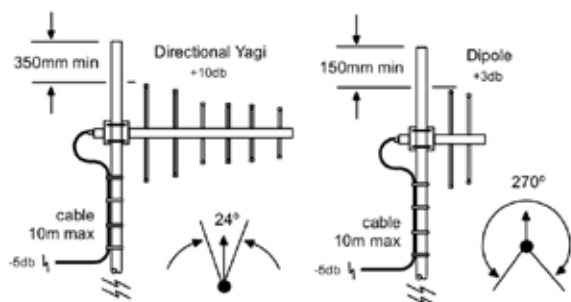


The following sections detail additional items that you can use to enhance the control and monitoring features and capabilities of your Metacentre management controller.

Options include, distributed intelligence for monitoring and controlling ancillary equipment such as cooling equipment, compressed air dryers, filters, drains etc. Sensors for monitoring pressure, temperature, dewpoint, flow etc. Network gateways, modems and communication servers that support integration with building management systems and dedicated PC application software for equipment visualisation and analysis.

Antenna:

For use in conjunction with Metacentre serial radio modems, 2 antenna options are available. Yagi antennas have a low field area (24°) with optimised range capability whereas Dipole antennas have a wide field area (270°) but a reduced range capability.



Only low-loss antenna cable should be used when connecting Yagi or Dipole antennas to the Metacentre serial radio modem.

Part No	Description	More info
Y07ENER23.00	Metacentre RX, Serial radio modem (Includes 10m Low loss antenna to Metacentre RX cable)	T54
Y03ENER04.00	Antenna, Yagi	T21
Y03ENER03.00	Antenna, Dipole	T21

Your Metacentre management controller is now complete!

Notes:

Add to your Metacentre system:

I/O Box:

Metacentre I/O Box modules are distributed and intelligent, configurative I/O modules that can be used on their own (e.g. as a desiccant dryer dewpoint dependent switching controller) or added to your Metacentre RS485 data network for controlling ancillary compressed air equipment such as cooling and compressed air treatment equipment, or for monitoring compressed air dryers, filters, drains, pressure, temperature, dewpoint, flow, vibration and current sensors etc.



There is no limit to the number of Metacentre I/O Box modules you can use, however Metacentre management controllers and software products are preprogrammed to visualise and display only a specific maximum number of I/O Box modules.

Each I/O Box module provides:

- 6 selectable single function relay outputs
- 8 selectable single function digital inputs
- 1 defined 'fault inhibit' digital input
- 4 selectable single function analogue inputs
 - Each of the 4 analogue inputs are configurative for analogue input signal type using analogue condition modules (ACM's) internally mounted to the I/O module. As standard, each I/O module is fitted with 2 x 4-20mA & 2 x KTY analogue input ACM's. These ACM's can be changed to a variety of signal alternatives as described below
- 1 defined 'control pressure' analogue input

I/O Box modules have a backlit LCD operator display interface with keys for menu navigation and configuration. A variety of software routines are accessible from the operator interface to configure each I/O Box for its intended use.

Part No	Description	More info
Y07ENER13.00	Metacentre I/O module	T81
Y07CM50.00	ACM Technician kit	T75
Y07CM51.00	ACM refill pack (6), Digital (black)	T75
Y07CM52.00	ACM refill pack (6), 0-10vDC (red)	T75
Y07CM53.00	ACM refill pack (6), 4-20ma (copper)	T75
Y07CM54.00	ACM refill pack (6), Earth referenced (blue)	T75
Y07CM55.00	ACM refill pack (6), KTY temperature (green)	T75
Y07CM56.00	ACM refill pack (6), PT100 temperature (red with capacitor)	T75
Y07CM57.00	ACM refill pack (6), PT1000 temperature (green with capacitor)	T75
Y07CM58.00	ACM refill pack (6), NTC 10k temperature (blue with capacitor)	T75

Sensors:

All sensors supplied and technically supported by EnergAir have been tested for their quality and suitability.



Our range of sensing products cover the common variety of sensing needs including pressure, temperature, dewpoint, flow, vibration and current condition monitoring. Other suitable sensors can be used in conjunction with Metacentre I/O Box modules.



Sensors, pressure:

Part No	Description	More info
Y04CM29.00	Sensor, pressure, 0 – 16barG, 4 – 20mA	T62
Y07CM66.00	Sensor, pressure, 0 – 5barG, 4 – 20mA	T62
Y07CM67.00	Sensor, pressure, 0 – 60barG, 4 – 20mA	T62
Y07CM68.00	Sensor, pressure, 0 – 600barG, 4 – 20mA	T62
Y07CM14.00	Sensor, pressure, 0 – -1barG relative, 4 – 20mA	T62

Sensors, temperature:

Part No	Description	More info
Y04CM30.00	Sensor, temperature, KTY, -10C - +132C, 1/8" BSP, Cyl 1 - 10mm, Junior AMP	T47
95VM05.00	Sensor, temperature, KTY, -10C - +135C, 3/8" BSP, Cyl 1 - 30mm, Junior AMP	T47
95VM07.00	Sensor, temperature, KTY, -10C - +135C, 1/8" NTP, Cyl 1 - 19mm, Junior AMP	T47
95VM24.00	Sensor, temperature, KTY, -10C - +135C, 3/8" BSP, Cyl 1 - 71mm, Junior AMP	T47
96VM14.00	Sensor, temperature, KTY, -10C - +135C, M10 x 1, Cyl 1 - 26mm, Junior AMP	T47
96VM15.00	Sensor, temperature, KTY, -10C - +135C, 1/8" BSP, Cyl 1 - 32mm, 2.5metre - 2core 0.5mm cable	T47
99CM24.00	Sensor, temperature, KTY, -10C - +132C, 3/4" - 16UNF, Junior AMP	T47
99CM32.00	Sensor, temperature, KTY, -10C - +135C, 8mm x 80mm sensor, 3metre - 2core 0.5mm cable	T47
Y01CM30.00	Sensor, temperature, KTY, -10C - +135C, 6.35mm x 150mm sensor plus 1/4" NPT compression fitting, 3metre - 2core 0.5mm cable	T47
Y01ENER20.00	Sensor, temperature, KTY, -10C - +135C, M16 x 1, 150mm - 0.5mm cable c/w male crimps	T47
Y01ENER21.00	Sensor, temperature, KTY, -10C - +135C, M20 x 1, 150mm - 0.5mm cable c/w male crimps	T47



Part No	Description	More info
Y01ENER22.00	Sensor - temperature, KTY, -10C - +135C, M24 x 1, 150mm - 0.5mm cable c/w male crimps	T47
Y01ENER23.00	Sensor - temperature, KTY, -10C - +135C, 4mm x 20mm sensor	T47
Y01ENER24.00	Sensor - temperature, KTY, -10C - +135C, M4 clearance tag	T47
Y01CM26.00	Sensor - temperature, KTY, -10C - +135C, 3/8" BSP, Cyl 1 - 30mm, Junior AMP	T47
Y01ENER46.00	Sensor - temperature, KTY, -10C - +135C, 1/4" BSP, Cyl 1 - 25mm, Junior AMP	T47
Y01ENER25.00	Sensor - temperature, PT100, -50C - +260C, 1/4" BSP, Cyl 1 - 25mm, Junior AMP	T47
Y00CM02.00	Sensor - temperature, PT1000, -50C - +260C, 3/8" BSP, Cly 1 - 30mm, Junior AMP	T47
Y00CM03.00	Sensor - temperature, PT1000, -50C - +260C, 6mm x 80mm sensor, 3metre - 2core 0.5mm cable	T47
Y01CM01.00	Sensor - temperature, PT1000, -50C - +260C, M10 x 1, Cly 1 - 26mm, Junior AMP	T47
Y02CM11.00	Sensor - temperature, PT1000, -50C - +260C, 6mm x 80mm sensor, 3metre - 2core plus earth 0.5mm cable	T47
Y02ENER16.00	Sensor, temperature, PT1000, -50C - +260C, 1/4" BSP, Cyl 1 - 12mm, 300mm S304 stainless steel with 0.25" male crimps	T47

Sensors - dewpoint:

Part No	Description	More info
Y07CM69.00	Sensor, Dewpoint -80°C : +20°C td / 4-20mA output, max 50bar (Typical use: systems with membrane / absorption dryers)	T76
Y07CMC4.00	Sensor, Dewpoint -80°C : +20°C td / 4-20mA output, 50-350bar (Typical use: systems with membrane / absorption dryers)	T76
Y07CM70.00	Sensor, Dewpoint -20°C : +50°C td / 4-20mA output (typical use: system with Refrigerant dryers)	T76
Y07CM71.00	Sensor, Dewpoint (Ex / Zone 1 use) -80°C : +20°C td / 4-20mA output (Typical use: systems with membrane / absorption dryers)	T76
Y07CM72.00	Sensor, Dewpoint, mounting chamber, 0-16bar	T76
Y07CM73.00	Sensor, Dewpoint, mounting chamber, 0-350bar	T76
Y07CM74.00	Sensor, Dewpoint, precision calibration of sensor	T76

Sensor – flow:

Part No	Description	More info
Y06CM14.00	Sensor, Compressed air flow, calometric, 4-20mA & DC pulse outputs (220mm shaft)	T73
Y07CM75.00	Sensor, Compressed air flow, calometric, 4-20mA & DC pulse outputs (400mm shaft)	T73

Y07CM76.00	Sensor, Compressed air flow, Drilling jig (including drill)	T73
Y07CM81.00	Sensor, Compressed air flow, Drill collar, 50 - 57mm Ø pipe including valve	T73
Y07CM82.00	Sensor, Compressed air flow, Drill collar, 56 - 63mm Ø pipe including valve	T73
Y07CM77.00	Sensor, Compressed air flow, Drill collar, 58 - 65mm Ø pipe including valve	T73
Y07CM78.00	Sensor, Compressed air flow, Drill collar, 67 - 74mm Ø pipe including valve	T73
Y07CM79.00	Sensor, Compressed air flow, Drill collar, 73 - 80mm Ø pipe including valve	T73
Y07CM83.00	Sensor, Compressed air flow, Drill collar, 76 - 83mm Ø pipe including valve	T73
Y07CM84.00	Sensor, Compressed air flow, Drill collar, 82 - 89mm Ø pipe including valve	T73
Y07CM85.00	Sensor, Compressed air flow, Drill collar, 87 - 94mm Ø pipe including valve	T73
Y07CM86.00	Sensor, Compressed air flow, Drill collar, 89 - 98mm Ø pipe including valve	T73
Y07CM87.00	Sensor, Compressed air flow, Drill collar, 95 - 102mm Ø pipe including valve	T73
Y07CM88.00	Sensor, Compressed air flow, Drill collar, 102 - 112mm Ø pipe including valve	T73
Y07CM89.00	Sensor, Compressed air flow, Drill collar, 108 - 118mm Ø pipe including valve	T73
Y07CM90.00	Sensor, Compressed air flow, Drill collar, 118 - 128mm Ø pipe including valve	T73
Y07CM91.00	Sensor, Compressed air flow, Drill collar, 125 - 135mm Ø pipe including valve	T73
Y07CM92.00	Sensor, Compressed air flow, Drill collar, 132 - 142mm Ø pipe including valve	T73
Y07CM93.00	Sensor, Compressed air flow, Drill collar, 138 - 148mm Ø pipe including valve	T73
Y07CM94.00	Sensor, Compressed air flow, Drill collar, 145 - 155mm Ø pipe including valve	T73
Y07CM95.00	Sensor, Compressed air flow, Drill collar, 151 - 161mm Ø pipe including valve	T73
Y07CM96.00	Sensor, Compressed air flow, Drill collar, 159 - 170mm Ø pipe including valve	T73
Y07CM97.00	Sensor, Compressed air flow, Drill collar, 167 - 177mm Ø pipe including valve	T73
Y07CM98.00	Sensor, Compressed air flow, Drill collar, 176 - 186mm Ø pipe including valve	T73
Y07CMA0.00	Sensor, Compressed air flow, Drill collar, 193 - 203mm Ø pipe including valve	T73
Y07CMA1.00	Sensor, Compressed air flow, Drill collar, 200 - 210mm Ø pipe including valve	T73
Y07CMA2.00	Sensor, Compressed air flow, Drill collar, 209 - 219mm Ø pipe including valve	T73

Sensor – vibration:

Part No	Description	More info
Y01ENER28.00	Sensor - Vibration, Bearing monitor module (2 channels)	T20
Y01ENER27.00	Sensor - Vibration, Shock pulse transducer – ‘tapping’	T19
Y04ENER03.00	Sensor - Vibration, Shock pulse transducer – ‘glue on’	T19
Y01ENER39.00	Cable – transducer to monitor module, 4metre, c/w connectors. (1 required per bearing sensor)	T19 & T20

Sensors – current:

Part No	Description	More info
Y03CM62.00	Sensor - Current 0 - 200 Amp	T61
Y03CM63.00	Sensor - Current 0 - 500 Amp	T61

Ancillary products - Power supplies:

Module, 24v – 28v DC (adjustable) power supplies for DIN rail mounting with connectors.



Part No	Description	More info
Y02CM18.00	Module, 24V to 28V DC, 30W (adjustable) power supply for DIN rail with connectors	T52
Y07CM42.00	Module, 24V to 28V DC, 80W (adjustable) power supply for DIN rail with connectors	T52

Ancillary products – Relays, timers, signal repeaters:

The following relays and timers are commonly used when interfacing with some compressor types. The signal repeater provides a repeated and isolated 4-20mA signal.

Part No	Description	More info
Y07ENER04.00	Timer, multi function	T74
Y05CM49.00	Signal isolator / repeater, 4-20mA	T71
Y01ENER34.00	Relay, 24v DC	T26
Y01ENER35.00	Relay, 24v AC	T26
Y01ENER36.00	Relay, 110v AC	T26
Y01ENER37.00	Relay, 230v AC	T26

Gateways, modems & Ethernet Comm. servers:

Our range of network gateways, modems and Ethernet comm. servers are dedicated devices that support communication between an external device (e.g. a personal computer or building management system) and the Metacentre RS485 data network.



Network gateways:

Metacentre has its own dedicated and purpose engineered protocol called 'Multi485'. Multi485 is the only protocol that functions on the Metacentre RS485 data network.

Network gateways provide a means of communication between 2 different protocols; Multi485 on the one hand and either DDE (direct data exchange) or MODBUS RTU on the other. Each network gateway has a 2-pin RS485 terminal for connection to the RS485 data network, a 2-pin RS485 terminal for connection to a RS485 MODBUS data network and / or a RS232 terminal for DDE communication.

Part No	Description	More info
Y04CM51.00	Gateway, DDE network interface	T65
Y04CM54.00	Gateway, MODBUS network interface	T66
Y00CM04.00	Gateway, Dual DDE & Modbus network interface	T42
Y05CM10.00	USB – RS232 Converter cable	T72

Comm Box:

The Comm. Box module is purpose engineered to provide a variety of local and remote connectivity options with a Metacentre RS485 data network. In addition, the Comm. Box has an industrial modem and a data logger that stores performance data that can be accessed for analysis with Enersoft – analysis. (See Enersoft – analysis for more information on this feature)

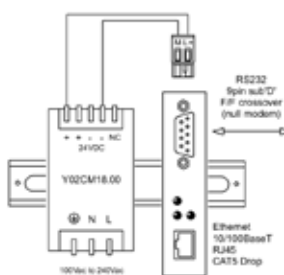


The Comm. Box has a 2-pin RS485 terminal for connection to the Metacentre RS485 data network, a RJ45 socket for connection to a suitable telephone network socket, a 2-pin RS485 MODBUS RTU terminal for connection to a RS485 MODBUS data network and a RS232 terminal for DDE communication with a PC.

Part No	Description	More info
Y00ENER22.00	Metacentre, Comm Box	T42
ASSC097	Cable, Metacentre Comm. Box to PC (RS232 / RS232)	NA
N/A	Software upload, Comm Box SMS	NA
Y05CM10.00	USB – RS232 Converter cable	T72

Ethernet comm. server:

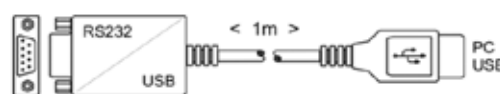
For use with 10BaseT or 100BaseT Ethernet networks (auto sensing). The Ethernet Comm. Server will enable serial data to be propagated through an Ethernet network to a dedicated networked PC assigned to communicate with a Metacentre RS485 data network. The 9pin Sub 'D' terminal of the Ethernet Comm. server connects with the RS232 port of Y04CM51.00 and Y00CM04.00 network gateways and the RS232 port of an Y00ENER22.00 Comm. Box. The Ethernet comm. server is connected to a site Ethernet using an RJ45 connection on a CAT3 (10BaseT) or CAT5 (100BaseT) cable drop from a local Ethernet system hub.



Part No	Description	More info
Y03ENER08.00	Kit, module, ethernet comm server, high speed serial to network (Ethernet) c / w PSU	T57

USB – RS232 Converter cable:

Provides USB connectivity to new and existing RS232 devices.



Part No	Description	More info
Y05CM10.00	USB – RS232 Converter cable	T72

Software:

Enersoft - visualisation:

Enersoft - visualisation is a dedicated compressed air supervisory & monitoring software package for use with Metacentre Management systems. The software is loaded to a personal desktop or laptop computer and connects to the Metacentre RS485 network via RS232 serial communications and a Metacentre network gateway, Comm. Box modem or Ethernet comm. server.



Enersoft – visualisation is available as an upgrade to existing owners of previous Enersoft – visualisation software versions.

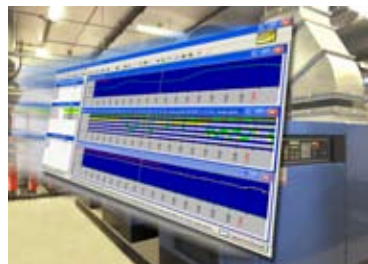
The Enersoft command start / stop upgrade adds the feature of PC based Metacentre system start / system stop to the software.

Enersoft – visualisation, multi-connection manager allows users to store and manage multiple Metacentre Station files. Metacentre Station files retain site and system specific configuration data. Multi-station connection manager is therefore useful where Enersoft – visualisation is used to connect with more than one Metacentre management system.

Part No	Description	More info
Y03CM13.00	Kit, PC Visualisation (includes Enersoft – visualisation software, a network gateway, gateway power supply and interconnecting cables)	T56 & T43
Y01ENER03.00	Enersoft - visualisation	T43
Y03ENER05.00	Upgrade, Enersoft – visualisation, system command start / stop	T43
Y03ENER07.00	Upgrade, Enersoft – latest release (for existing users of enersoft Pro – visualisation only)	T43
Y03ENER06.00	Enersoft - visualisation, multi station connection manager	T43

Enersoft – analysis:

Enersoft - analysis is a dedicated compressed air supervisory and analysis software package for use with Metacentre Management systems. The software is loaded to a personal desktop or laptop computer and connects to the Metacentre RS485 network via RS232 serial communications and a Metacentre network gateway, Comm. Box modem or Ethernet comm. server.



Enersoft – analysis can work in real time or in conjunction with the Comm. Box data logger where performance data over the previous 7 days is continually stored for analysis.

Part No	Description	More info
Y01CM20.00	Software, Enersoft - Analysis ANI (for downloading from Comm Box data logger)	T44
Y01CM21.00	Software, Enersoft - Analysis RTM (for real time monitoring via Metacentre network gateway)	T44
Y01CM22.00	Software, Enersoft - Analysis RTL (for real time logging via Metacentre network gateway)	T44

MODBUS RTU Tables:

MODBUS RTU (Remote Terminal Unit) is a master/slave type protocol with a Metacentre product functioning as the slave device. Information requests or commands are communicated from master to slave only. A Metacentre product, interfacing direct, or through a MODBUS Gateway, will always respond to communications from a remote master device in accordance with the MODBUS RTU protocol standard. Purchasing MODBUS RTU tables provide a complete dossier of data for each item of Metacentre hardware along with information relating to the use of tables and MODBUS RTU on the Metacentre RS485 data network.

Part No	Description	More info
MANY0313A.00	Tables, MODBUS RTU, Metacentre	T48

Retrofit variable speed drive (VSD):

Significant efficiency gains can be achieved by retrofitting a variable speed drive to a designated compressor(s) in a single or multiple compressor installation. EnergAir overcomes any difficulties with retrofitting a VSD using its 'VSD-R' interface controller. Importantly, with this module fitted the compressor will remain standard and "believe" that it is running its own standard motor and regulating in Load/Unload mode. In addition, the 'VSD-R' interface controller enables the compressor motor control and safety circuits to remain intact and functional to original manufacturer's specifications, and have priority over the VSD drive run operation.



The 'VSD-R' interface controller also interfaces the variable speed drive to the Metacentre compressor Management controller (where installed). The latter employs an enhanced efficiency single pressure band control philosophy, capable of selecting from alternate machine sizes and is fully VSD compressor aware, meaning that it is capable of forming a coherent air compressor management system which acts in unison with all system resources to provide optimum efficiency at all times and under all operating conditions.

Part No	Description	More info
Y05ENER04.00	9.5AMP FLC retrofit VS Drive (4kW @ 400v nominal)	T38
Y05ENER05.00	12 AMP FLC retrofit VS Drive (5.5kW @ 400v nominal)	T38
Y05ENER06.00	16.5 AMP FLC retrofit VS Drive (7.5kW @ 400v nominal)	T38
Y05ENER07.00	24 AMP FLC retrofit VS Drive (11kW @ 400v nominal)	T38
Y05ENER08.00	33 AMP FLC retrofit VS Drive (15kW @ 400v nominal)	T38
Y05ENER09.00	42 AMP FLC retrofit VS Drive (18.5kW @ 400v nominal)	T38
Y05ENER10.00	50 AMP FLC retrofit VS Drive (22kW @ 400v nominal)	T38
Y05ENER11.00	60 AMP FLC retrofit VS Drive (30kW @ 400v nominal)	T38
Y05ENER12.00	75 AMP FLC retrofit VS Drive (37kW @ 400v nominal)	T38
Y05ENER13.00	90 AMP FLC retrofit VS Drive (45kW @ 400v nominal)	T38
Y05ENER14.00	115 AMP FLC retrofit VS Drive (55kW @ 400v nominal)	T38
Y05ENER15.00	150 AMP FLC retrofit VS Drive (75kW @ 400v nominal)	T38
Y05ENER16.00	180 AMP FLC retrofit VS Drive (90kW @ 400v nominal)	T38
Y05ENER17.00	210 AMP FLC retrofit VS Drive (110kW @ 400v nominal)	T38
Y05ENER18.00	250 AMP FLC retrofit VS Drive (132kW @ 400v nominal)	T38
Y05ENER19.00	300 AMP FLC retrofit VS Drive (160kW @ 400v nominal)	T38
Y05ENER20.00	370 AMP FLC retrofit VS Drive (200kW @ 400v nominal)	T38
Y05ENER21.00	460 AMP FLC retrofit VS Drive (250kW @ 400v nominal)	T38
Y05ENER22.00	570 AMP FLC retrofit VS Drive (315kW @ 400v nominal)	T38

DIY Retrofit VSD:

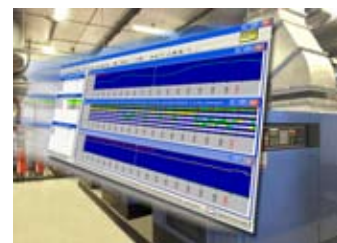
Prefer to do it yourself? Have your own panel build capability? EnergAir VSD-R interface controller kits are available to purchase separately and provide panel builders, system integrators and competent individuals with a ready made retrofit VSD kit (i.e. excludes the inverter panel assembly). The kit includes the items detailed previously plus guidance notes on compressor integration aspects of retrofit VSD. Panel builders, system integrators and competent individuals must separately purchase their inverter and inverter panel assembly.

Part No	Description	More info
Y05ENER24.00	Metacentre, VSD-R (KEB – data) interface controller kit	T38
Y07ENER24.00	Metacentre, VSD-R mA (4-20mA output) interface controller kit	T38

Auditing equipment & software:

Energsoft – analysis is available for use with dedicated compressed air equipment auditing hardware. This hardware and software allow specifiers to capture data, analyse and make recommendations on future compressed air use strategies.

Our auditing hardware consists of an industrial PC housed within a ruggedised case enclosure. 16 dedicated analogue sensor inputs are accessible from the case exterior where up to 12 air compressor can be connected and have current logged at sample rates down to 2 seconds per channel and for up to 78 days continuous logging. System pressure is also logged and the 3 remaining sensor inputs can be used to gather other data (e.g. flow data) as necessary. Sensors for capturing compressor current, system pressure and flow data along with interconnecting and extension cables complete the auditing hardware.



Part No	Description	More info
99CM13.00	Kit - Loggerbox (Logger, Logger software, power cable, RS232 cable and user manuals)	T29
Y00CM27.00	Sensor, pressure, 0-16bar, 4-20mA c / w 10 metre LoggerBox connecting cable	T29
Y01ENER26.00	Sensor, current, 200A / 1000A switchable current sensor c / w 1 metre connecting cable	T29
Y06CM15.00	Sensor, 'compressed air flow', calorimetric to a maximum of 92.7m/sec, 4-20mA & DC pulse outputs c / w 1 metre connecting cable	T73
Y00CM28.00	Cable, 10 metre, Sensor to Logger-Box (for use with Y01ENER26.00 & Y06CM15.00)	T29
Y00CM29.00	Cable, 10 metre, extension (for use with Y00CM28.00)	T29
Y01CM19.00	Software, Energsoft - Analysis LGB (for downloading from LoggerBox)	T44
Y05CM40.00	Upgrade, Energsoft - Analysis latest release (for existing users of Energsoft - Analysis or EMAS Manager only)	T44
ASSC011	Cable, LoggerBox to PC (RS232)	T29
Y05CM10.00	USB – RS232 Converter cable	T72

Labour:

Description
Labour – Day rate, inclusive travel time and mileage costs
Labour – Hour rate, excludes travel time and mileage costs
Mileage – per mile (UK) / per km (EU) travelled, round trip

Tools:

Part No	Description	More info
Y03CM04.00	Kit, 'FLASH' programmer	NA





EnerAir regional offices

UK PO Box 974, Woking, Surrey, GU22 8ZJ, UK
T: +44 (0) 1932 343638 • F: +44 (0) 1932 340809
email: sales@energair.co.uk

Europe Industriepark De Bruwaan 37B, Oudenaarde, B-9700,
Belgium T: +32 (0) 55 23 70 90 • F: +32 (0) 32 55 45 75 18
email: sales@energair.co.uk

Asia Units C60–C66, 11/F, Shanghai Mart 2299 Yanan Road West,
Shanghai, China
T: +86 (0) 21 6236 0700 • F: +86 (0) 21 6236 0706
email: sales@energair.com.cn



Visit www.energair.com to find your local EnerAir representative.