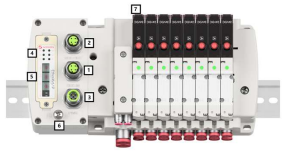
EtherNet/IP

SAFETY, WARNINGS

This product is intended for use in industrial compressed air or hydraulic system only. Do not use this product where pressures and temperatures can exceed those under 'Technical Data'.
Before using this product with fluids other than those specified, for non-industrial applications, life-support systems, or other applications not within published specifications, consult Norgren. Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes. The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.
System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided. System designers and end users are cautioned to review specification warnings found in instruction sheets packed and shipped with this product.

Specific warnings:
- Check that the specification of the Valve Island and marking on the item of the equipment are suitable for the application being used on.
- Check technical data, such as operating pressure, voltage level, current type and temperature, on the product label or in the data sheets for compliance with the existing operating conditions.
- After removing the packaging, ensure that no contamination enters into the system.
- Check before the installation of the system that no contamination exists in the piping and valve island.
- Check during installation of the system that gaskets have not become damaged.
- Take measures to avoid unintentional or improper activation.
- Prior to the first electrical operation, ensure no danger would result from the medium exhausting from any open ports.
- Consider in case of pressurised systems that lines, valves and other components should not be removed.
- To avoid damaging the product, please make sure that the maximum torque values are not exceed.
- **IMPORTANT:** Always switch off the air supply, exhaust the residual pressure and unplug all electrical connections before performing any maintenance.
- Ensure the machine is in a safe condition before operating manual overrides.
- Pay due course and attention to the different polarity types available - PNP/NPN.
- A polarity protection diode is built in: Incorrect polarity does not cause a short circuit and does not require replacement valve slices. In this case only LED indicator works, but not valve slices.

ELECTRICAL INTERFACE



Item No.	Description	Remark
1	Port 1	EtherNet/IP Network PORT 1 M12 x 1 | Female | 4 – pin | D – coded
2	Port 2	EtherNet/IP Network PORT 2 M12 x 1 | Female | 4 – pin | D – coded
3	PWR	Power supply to control module and valves M12 x 1 | Male | 5 – pin | A – coded
4	Status LEDs	EtherNet/IP control module status LEDs
5	IP address switch	Options for IP configuration modes
6	Earth screw	Terminal for functional earth (M4)
7	Valve status LEDs	Solenoid A (14 Solenoid) Solenoid B (12 Solenoid)

PIN ALLOCATING OF PORT 1 / PORT 2

M12 / 4 pins / female connector / D-coded	
Pin No.	Function
1	Transmission Data + (TD +)
2	Receive Data + (RD +)
3	Transmission Data - (TD -)
4	Receive Data - (RD -)

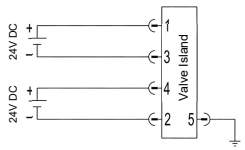
LED STATUS DESCRIPTION

Symbol	LED Status	Description
NS	Off	No IP address or no power
	Green on	Connected
	Flashing green	Not Connected
	Flashing red	Connection Timeout
MS	Off	No power
	Green on	Device Operational
	Flashing red	Recoverable fault
	Red on	Non-recoverable fault
P1	Off	Link Connection Not Established
	Flashing yellow / green	Link Communication Active
	Yellow on	Link Connection Established
P2	Off	Link Connection Not Established
	Flashing yellow / green	Link Communication Active
	Yellow on	Link Connection Established
VA (Valve Power Supply)	Green on	Voltage OK
	Flashing red	Undervoltage
	Red	Overvoltage
VB (Electronics Power Supply)	Green on	Voltage OK
	Flashing red	Undervoltage
	Red	Overvoltage

PIN ALLOCATING OF POWER SUPPLY CONNECTOR

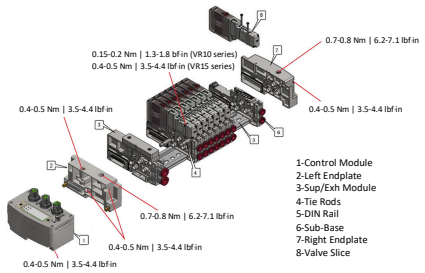
M12 / 5 pins / Male connector / A-coded	
Pin No.	Function
1	L1 (VB +) 24V electronics power supply
2	N2 (VA -) 0V valves power supply
3	N1 (VB -) 0V electronics power supply
4	L2 (VA +) 24V valves power supply
5	FE (functional earth)

WIRING OF POWER SUPPLY CONNECTOR



. Notes:
- Make sure electronics power, valves power and their polarities are connected to correct pins respectively before switching on.
- Select the appropriate cables to mate with the connectors mounted on the control module.
- Connect the earth screw to ground.

INSTALLATION



Notes:
- **Lubrication:** Valves will function reliably when they are supplied with clean dry air either lubricated or non-lubricated. If the air supply is lubricated, then lubrication must be supplied for the life of the product.
- **Vibration:** In applications where there is significant vibration, the axis of the spool (longitudinal axis of the valve) should be at 90° to the direction of the motion.
- **Tightening torque:**
  M2: 0.15~0.2 Nm (1.3~1.8 lbf·in)
  M3: 0.4~0.5 Nm (3.5~4.4 lbf·in)
  M4: 0.7~0.8 Nm (6.2~7.1 lbf·in)
- **Port identification:**

Function	Port / Identification
Main/internal pilot air supply	P / 1
Exhaust	E / 3 / 5
Outlet	A / 4 & B / 2
External pilot air supply (if used)	12 / 14
Collected exhaust of pilot valves	82 / 84

SOLENOID NUMBER, OUTPUT POINT & VALVE STATION MAPPING

- If valve stations ⩽ 12, 2 solenoid numbers are always reserved for each valve station. * Detailed allocation is shown as below:

Station	#1	#2	#3	…	#10	#11	#12
Solenoid A	Sol.01	Sol.03	Sol.05	…	Sol.19	Sol.21	Sol.23
(14 Solenoid)	Output 0	Output 2	Output 4		Output 18	Output 20	Output 22
Solenoid B	Sol.02	Sol.04	Sol.06	…	Sol.20	Sol.22	Sol.24
(12 Solenoid)	Output 1	Output 3	Output 5		Output 19	Output 21	Output 23

Notes:
* For valve station with single solenoid, only Solenoid A (14 Solenoid) is connected.
Consider the one which is closest to control module as 1st station (Station #1).

- If 12 < valve stations ⩽ 24, special rules are required since only 1 solenoid number is reserved to valve station with single solenoid:
  - Sequence all solenoids following the rules below by starting from 1st station which is the station closest to control module:
    1)If 1st station is with double solenoids, sequence solenoid A as Sol.01, solenoid B as Sol.02, following 2nd station solenoid A as Sol.03, solenoid B as Sol.04……
    2)If 1st station is with single solenoid, sequence solenoid A as Sol.01, following 2nd station solenoid A as Sol.02, solenoid B as Sol.03……
    3)If a station is originally configured as blank, always 2 solenoid numbers are allocated.
    4)The rest of stations should also adhere to the sequence rules above.
  - A 14-station 24 solenoids valve island example is shown below:

	Double Solenoids	Double Solenoids	Single Solenoid	Single Solenoid	Double Solenoids	Double Solenoids	Single Solenoid	Double Solenoids	Single Solenoid	Double Solenoids
Station	#1	#2	#3	#4	…	#10	#11	#12	#13	#14
Sol. A	Sol. 01	Sol. 03	Sol. 05	Sol. 06	…	Sol. 17	Sol. 19	Sol. 20	Sol. 22	Sol. 23
(14 Sol.)	Output 0	Output 2	Output 4	Output 5		Output 16	Output 18	Output 19	Output 21	Output 22
Sol. B	Sol. 02	Sol. 04	--*	--*	…	Sol. 18	--*	Sol. 21	--*	Sol. 24
(12 Sol.)	Output 1	Output 3				Output 17		Output 20		Output 23

Note: * For valve station with single solenoid, only Solenoid A (14 Solenoid) is allocated & connected.

SETTING

- **IP address switch**
  IP address switch is all in "0" position (remote control mode) by default.
  Detailed IP address switch setting can be found in operation & service manual.

- **Configuration**
  The EDS (Electronic Data Sheet) file is used to configure VR10/VR15.

  EDS file name: "NORGREN-VR1X-EP-Vxx-JJJJMMDD.eds"

  Note: "JJJJMMDD" (JJJJ-year, MM-month, DD-day) is date of release, "Vxx" is revision.

  The EDS file is available from the web link:

  https://www.norgren.com/uk/en/technical-support/software

- **Output mapping**

Output Byte 0								
Solenoid	Sol.08	Sol.07	Sol.06	Sol.05	Sol.04	Sol.03	Sol.02	Sol.01
Bit	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Byte 1								
Solenoid	Sol.16	Sol.15	Sol.14	Sol.13	Sol.12	Sol.11	Sol.10	Sol.09
Bit	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Byte 2								
Solenoid	Sol.24	Sol.23	Sol.22	Sol.21	Sol.20	Sol.19	Sol.18	Sol.17
Bit	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Detailed solenoid number, output point & valve station mapping information is listed in operation & service manual.

- **Parameterization and Diagnostic**
  Detailed parameterization settings and diagnostics information is listed in operation & service manual.

  Operation & service manual is available on website:
  https://www.norgren.com/uk/en/technical-support/installation-maintenance-instructions/valves

Norgren operates four global centers of technical excellence and a sales and service network in 50 countries, as well as manufacturing capability in the USA, Germany, China, UK, Switzerland, Czech Republic, Mexico and Brazil. For information on all Norgren companies visit https://www.norgren.com. Supported by distributors worldwide.