

Relay Output Modules

D3-08TR Relay Output <---->	
Outputs per Module	8
Commons per Module	2 (isolated)
Operating Voltage	5-265VAC 5-30VDC
Output Type	Form A (SPST)
Peak Voltage	265VAC/30VDC
AC Frequency	47-63Hz
ON Voltage Drop	N/A
Max. Current	4A/point AC 5A/point DC 6A/common
Max Leakage Current	1mA @ 220VAC
Max Inrush Current	5A
Minimum Load	5mA @ 5V
Base Power Required	9V 45mA/ON pt. (360 mA max) 24V N/A
OFF to ON Response	5ms
ON to OFF Response	5 ms
Terminal Type	Non-removable
Status Indicators	Logic side
Weight	7oz. (200g)
Fuses	2 (one 10A per common) Order D3-FUSE-5 (5 per pack) <---->

D3-16TR Relay Output <---->	
Outputs per Module	16
Commons per Module	2 (isolated)
Operating Voltage	5-265VAC 5-30 VDC
Output Type	16 Form A (SPST)
Peak Voltage	265VAC/30VDC
AC Frequency	47-63Hz
ON Voltage Drop	N/A
Max. Current	2A/point AC/DC (resistive) 8A/common AC/DC*
Max Leakage Current	0.1mA @ 220VAC
Max Inrush Current	2A
Minimum Load	5mA @ 5V
Base Power Required	9V 30mA/ON pt. (480 mA max) 24V N/A
OFF to ON Response	12ms
ON to OFF Response	12ms
Terminal Type	Removable
Status Indicators	Logic side
Weight	8.5oz. (248g)
Fuses	None

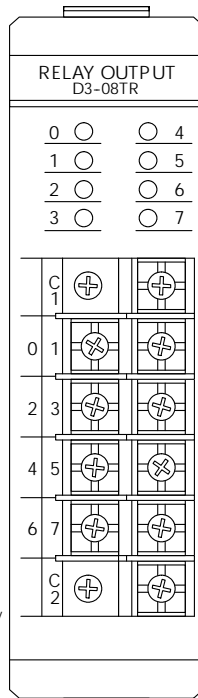
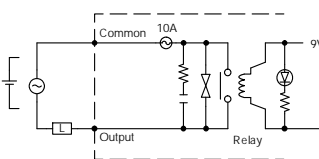
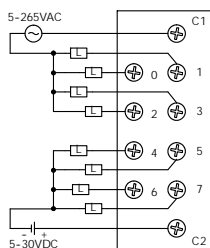
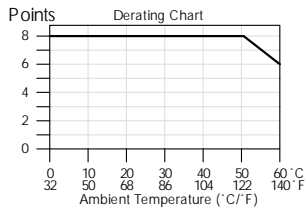
See page 5-29 for part numbers of ZIPLink cables and connection modules compatible with this I/O module.

Note: When used with the ZIPLink wiring system, relay outputs are derated not to exceed 2 Amps per point max.



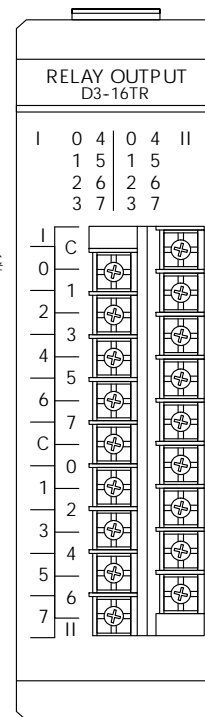
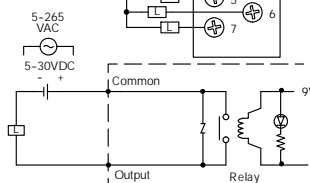
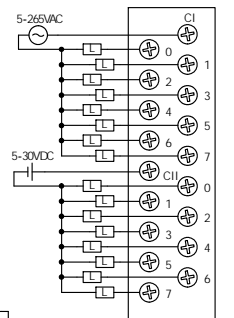
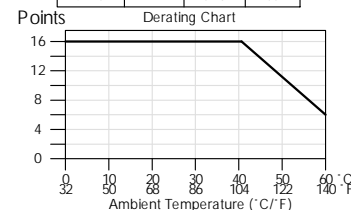
Typical Relay Life (Operations)

Voltage	Resistive	Solenoid	Closures
220VAC	4A	0.5A	100k
220VAC	0.05A	800k	
110VAC	4A	0.5A	100k
110VAC	0.1A	650k	
24VDC	5A	0.5A	100k



Typical Relay Life (Operations)

Voltage	Resistive	Solenoid	Closures
220VAC	2A	0.25A	100k
220VAC	0.03A	800k	
110VAC	2A	0.25A	100k
110VAC	0.05A	650k	
24VDC	2A	0.25A	100k



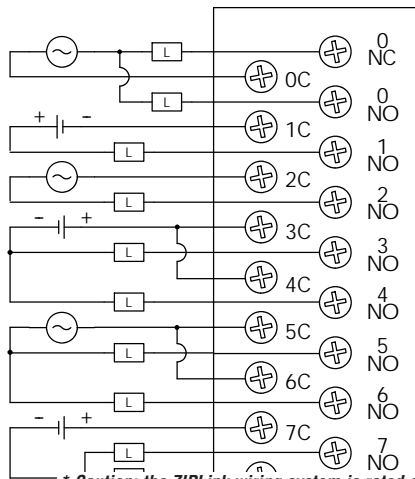
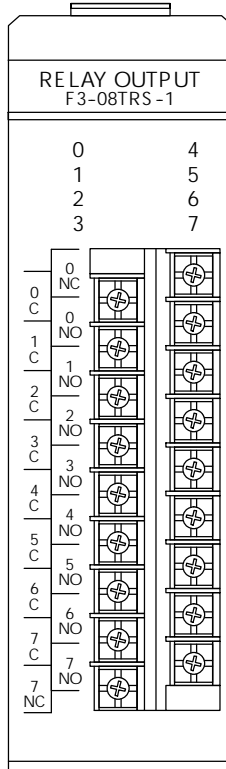
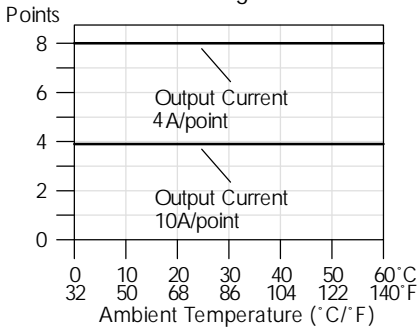
Relay Output Modules

F3-08TRS-1 Relay Output <---->	
Outputs per Module	8
Commons per Module	8 (isolated)
Operating Voltage*	12-125VAC 125-250VAC (requires external fuses) 12-30VDC
Output Type	6 Form A (SPST), 2 Form C (SPDT)
Max Current (resistive)	10A/point AC/DC, 32A/module AC/DC*
Max leakage Current	N/A
Max Inrush Current	10A inductive
Minimum Load	100mA @ 12VDC
Base Power Required	9V 37mA/ON pt., (296mA max), 24V N/A
OFF to ON Response	13ms max
ON to OFF Response	9ms max
Terminal Type	Removable
Status Indicators	Logic side
Weight	8.9oz. (252 g)
Fuses	8 fuses (10A, 125V), Non-replaceable
Peak Voltage	265VAC/120VDC
AC Frequency	47-63Hz
ON Voltage Drop	N/A

* Caution: the ZIPLink wiring system is rated at 2 Amps per I/O point and 4 Amps per common, therefore the F3-08TRS-1 relay outputs are derated to 2 Amps per point and 4 Amps per common when used with the ZIPLink wiring system.

Note: Maximum DC voltage rating is 120VDC at .5 Amp, 30,000 cycles typical. Motor starters up to and including NEMA size 4 can be used with this module.

Derating Chart



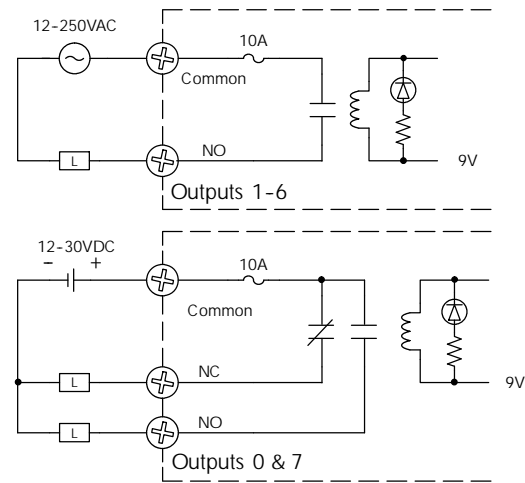
* Caution: the ZIPLink wiring system is rated at 2 Amps per I/O point and 4 Amps per common, therefore the D3-16TR relay outputs are derated to 2 Amps per point and 4 Amps per common when used with the ZIPLink wiring system.

Typical Relay Life			
Max. Resistive or Inductive Inrush Load Current	Operating Voltage		
	28VDC	120VAC	240VAC
1/4HP		25K	
10.0A	50K	50K	
5.0A	200K	100K	
3.0A	325K	125K	50K
.05A	> 50M		

See page 5-29 for part numbers of ZIPLink cables and connection modules compatible with this I/O module.



Note: When used with the ZIPLink wiring system, relay outputs are derated not to exceed 2 Amps per point max.



Relay Output Modules

F3-08TRS-2 Relay Output <---->	
Outputs per Module	8
Commons per Module	8 (isolated)
Operating Voltage*	12-250VAC 12-30 VDC
Output Type	6 Form A (SPST), 2 Form C (SPDT)
Peak Voltage	265VAC/ 120VDC
AC Frequency	47-63Hz
ON Voltage Drop	N/A
Max Current (Resistive)	4A/point AC/DC, 32A/module AC/DC*
Max Leakage Current	N/A

Max Inrush Current	10A inductive
Minimum Load	100mA @ 12VDC
Base Power Required	9V 37mA/ON pt. (296 mA Max), 24V N/A
OFF to ON Response	13ms max
ON to OFF Response	9ms max
Terminal Type	Removable
Status Indicators	Logic side
Weight	9oz. (255 g)
Fuses	8 fuses (10A, 125V), replaceable Order D3-FUSE-6 (5 per pace) <----> or use 19379-K-10A Wickman

* Caution: the ZIPLink wiring system is rated at 2 Amps per I/O point and 4 Amps per common, therefore the F3-08TRS-2 relay outputs are derated to 2 Amps per point and 4 Amps per common when used with the ZIPLink wiring system.

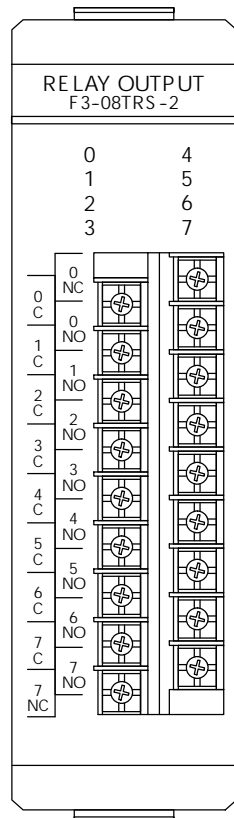
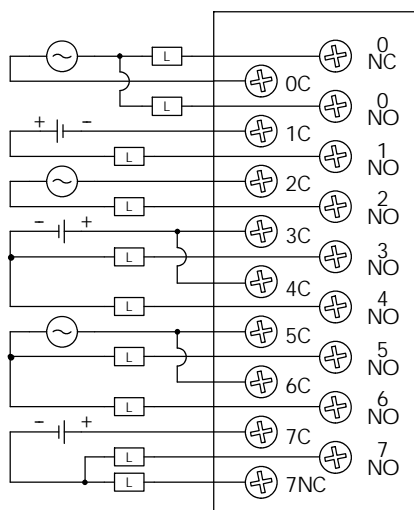
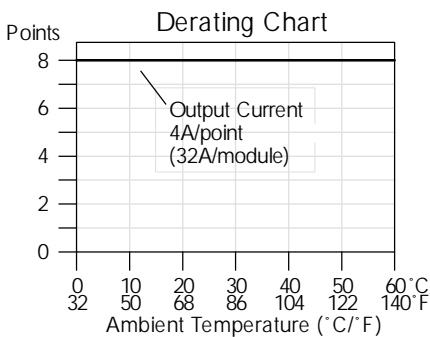
Note: Maximum DC voltage rating is 120VDC at 0.5 Amp, 30,000 cycles typical.

Motor starters up to and including NEMA size 3 can be used with this module.

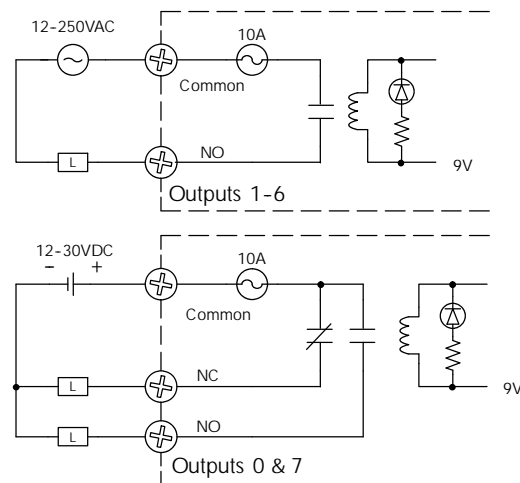
See page 5-29 for part numbers of ZIPLink cables and connection modules compatible with this I/O module.



Max. Resistive or Inductive Inrush Load Current	Operating Voltage		
	28VDC	120VAC	240VAC
5.0A	200K	100K	
3.0A	325K	125K	50K
0.5A	>50M		



Expected mechanical relay life is 100 million operations.



Power Budget

Managing your power resource

The I/O configuration depends on your choice of I/O modules, bases and I/O location. When determining the types and quantity of I/O modules you will be using, it's important to remember there is a limited amount of power available from the power supply.

The chart on the next page indicates the power supplied and used by each DL305 device. The adjacent chart shows an example of how to calculate the power used by your particular system. These two charts should make it easy for you to determine if the devices you have chosen fit within the power budget of your system configuration.

If the I/O you have chosen exceeds the maximum power available from the power supply, you can resolve the problem by shifting some of the modules to an expansion base.

WARNING: It is extremely important to calculate the power budget correctly. If you exceed the power budget, the system may operate in an unpredictable manner, which may result in a risk of personal injury or equipment damage.

Example: how to calculate your power usage

The following example shows how to calculate the power budget for the DL305 system. The examples are constructed around a single 5-slot base using the devices shown. It is recommended you construct a similar table for each base in your DL305 system.

- Using a chart similar to the one below, fill in column 2.
- Using the tables on the opposite page, enter the current supplied and used by each device (columns 3, 4, and 5). Devices which fall into the "Other" category (Row D) are devices such as the Handheld Programmer or a Data Communication Unit, which also have power requirements, but do not directly plug into the base.

- Add the current used by the system devices (columns 3, 4, and 5), starting with Slot 1, then put the total in the row labeled "Maximum Current Required" (Row E).
- Subtract the row labeled "Maximum Current Required" (Row E), from the row labeled "Current Supplied" (Row B). Place the difference in the row labeled "Remaining Current" (Row F).
- If "Maximum Current Required" is greater than "Current Supplied" in columns 3, 4 or 5, the power budget will be exceeded. It will be unsafe to use this configuration and you will need to restructure your I/O configuration.

Use ZIPLinks to reduce power requirements

If your application requires a lot of relay outputs, consider using the ZipLink AC or DC relay output modules. These modules can switch high current (10A) loads without putting a load on your base power budget. Refer to the Wiring Solutions section in this catalog for more information.

This logo is placed next to I/O modules that are supported by the ZIPLink connection systems. See the I/O module specifications at the end of this section.



A	Column 1	Column 2	Column 3	Column 4	Column 5
Base # 0	Device Type		5 VDC (mA)	9VDC (mA)	24V(mA)
B	Current Supplied				
5-slot Base	D3-05BDC		1400	800	500
C	Current Required				
CPU Slot	D3-330		300	50	0
Slot 0	D3-16NE3		0	130	0
Slot 1	D3-16NE3		0	130	0
Slot 2	D3-08TA-1		0	160	0
Slot 3	D3-08TA-1		0	160	0
D	Other				
	Handheld prog D3-HPP		50	50	0
E	Maximum Current Required		360	680	0
F	Remaining Current		1040	120	500

DL305 Power Requirements

This section shows the amount of power supplied by the base power supplies and the amount of power used by each DL305 device. Note the base power supplies provide three internal voltages (5V, 9V, 24V). The chart shows how much power from each of these power sources is required for each DL305 device. Use this information when calculating the power budget for your system.

In addition to the three internal power sources, the DL305 bases provide an external power connection. There is 24 VDC available from the 24 VDC output terminals on the bases (except D3-05BDC and D3-10BDC).

The 24 VDC can be used to power external devices or DL305 modules that require external 24 VDC. The power used from this external 24 VDC output reduces the internal system 24 VDC that is available to the modules by an equal amount. When using the 24 VDC output at the base terminal, it is recommended that 100 mA not be exceeded.

Power Consumed				
Device	5V(mA)	9V(mA)	24V(mA)	Ext req.
CPUs				
D3-330	300	50	0	0
D3-340	300	20	0	0
D3-350	500	0	0	0
DC Input Modules				
D3-08ND2	0	10	112	0
D3-16ND2-1	0	25	224	0
D3-16ND2F	0	25	224	0
F3-16ND3F	0	148	68	0
AC Input Modules				
D3-08NA-1	0	10	0	0
D3-08NA-2	0	10	0	0
D3-16NA	0	100	0	0
AC/DC Input Modules				
D3-08NE3	0	10	0	0
D3-16NE3	0	130	0	0
DC Output Modules				
D3-04TD1	0	12	5	0
D3-08TD1	0	20	24	0
D3-08TD2	0	30	0	0
D3-16TD1-1	0	40	96	0
D3-16TD2	0	180	0	0
AC Output Modules				
D3-04TAS	0	12	0	0
F3-08TAS-1	0	200	0	0
D3-08TA-1	0	160	0	0
D3-08TA-2	0	160	0	0
F3-16TA-2	0	250	0	0
D3-16TA-2	0	400	0	0

Power Supplied				
Device	5V(mA)	9V(mA)	24V(mA)	24 V (mA)
D3-05B-1	900	2000	500	100
D3-08B-1	900	2000	500	100
D3-10B-1	900	2000	500	100
D3-05BDC	900	2000	500	None
D3-10BDC	900	2000	500	None
D3-05B-NR	900	2000	500	100
D3-08B-NR	900	2000	500	100
D3-05BDC-NR	900	2000	500	None
Power Consumed				
Device	5V(mA)	9V(mA)	24V(mA)	External required
Relay Output Modules				
D3-08TR	0	360	0	0
F3-08TRS-1	0	296	0	0
F3-08TRS-2	0	296	0	0
D3-16TR	0	480	0	0
Analog Temperature and Thermocouple Modules				
F3-04ADS	0	183	50	0
F3-08AD-1	0	45	55	0
F3-08THM-n	0	50	34	0
F3-16AD	0	55	65	0
F3-04DA-1	0	144	108	0
F3-04DAS	0	154	145	0
Communications and Networking				
D3-232 DCU	500	0	0	Optional 5V@500mA
D3-422 DCU	500	0	0	Optional 5V@500mA
FA-UNICON	0	0	0	24V or 5V@ 100mA
D3- DCM	0	300	0	0
Specialty Modules				
D3-08SIM	0	10	112	0
D3-HSC	0	70	0	0
D3-TCSU	40	5	0	0
Programming				
D3-HP	50	50	0	0
D3-HPP	50	50	0	0
D2-HP	200	0	0	0
Specialty CPUs				
F3-OMUX-1	409	0	0	0
F3-OMUX-2	262	0	150	0
F3-PMUX	455	0	0	0
F3-RTU	416	0	0	0
Operator Interface				
DV-1000	150	0	0	0
C-more Micro-Graphic	210	0	0	0

Wiring Solutions using the ZIPLink Wiring System

ZIPLinks eliminate the normally tedious process of wiring between devices by utilizing prewired cables and DIN rail mount connector modules. It's as simple as plugging in a cable connector at either end or terminating wires at only one end. Prewired cables keep installation clean and efficient, using half the space at a fraction of the cost of standard terminal blocks. There are several wiring solutions available when using the ZIPLink System ranging from

PLC I/O-to-ZIPLink Connector Modules that are ready for field termination, options for connecting to third party devices, GS, DuraPulse and SureServo Drives, and specialty relay, transorb and communications modules. Pre-printed I/O-specific adhesive label strips for quick marking of ZIPLink modules are provided with ZIPLink cables. See the following solutions to help determine the best ZIPLink system for your application.

Solution 1: DirectLOGIC, CLICK and Productivity3000 I/O Modules to ZIPLink Connector Modules

When looking for quick and easy I/O-to-field termination, a ZIPLink connector module used in conjunction with a prewired ZIPLink cable, consisting of an I/O terminal block at one end and a multi-pin connector at the other end, is the best solution.



Using the PLC I/O Modules to ZIPLink Connector Modules selector tables located in this section,

1. Locate your I/O module/PLC.
2. Select a ZIPLink Module.
3. Select a corresponding ZIPLink Cable.

Solution 2: DirectLOGIC, CLICK and Productivity3000 I/O Modules to 3rd Party Devices

When wanting to connect I/O to another device within close proximity of the I/O modules, no extra terminal blocks are necessary when using the ZIPLink Pigtail Cables. ZIPLink Pigtail Cables are prewired to an I/O terminal block with color-coded pigtail with soldered-tip wires on the other end.



Using the I/O Modules to 3rd Party Devices selector tables located in this section,

1. Locate your PLC I/O module.
2. Select a ZIPLink Pigtail Cable that is compatible with your 3rd party device.

Solution 3: GS Series and DuraPulse Drives Communication Cables

Need to communicate via Modbus RTU to a drive or a network of drives?

ZIPLink cables are available in a wide range of configurations for connecting to PLCs and SureServo, SureStep, Stellar Soft Starter and AC drives. Add a ZIPLink communications module to quickly and easily set up a multi-device network.

Using the Drives Communication selector tables located in this section,

1. Locate your Drive and type of communications.
2. Select a ZIPLink cable and other associated hardware.



Solution 4: Serial Communications Cables

ZIPLink offers communications cables for use with *Direct*LOGIC, CLICK, and Productivity3000 CPUs, that can also be used with other communications devices. Connections include a 6-pin RJ12 or 9-pin, 15-pin and 25-pin D-sub connectors which can be used in conjunction with the RJ12 or D-Sub Feedthrough modules.

Using the **Serial Communications Cables** selector table located in this section,

1. Locate your connector type
2. Select a cable.



Solution 5: Specialty ZIPLink Modules

For additional application solutions, ZIPLink modules are available in a variety of configurations including stand-alone relays, 24VDC and 120VAC transorb modules, D-sub and RJ12 feedthrough modules, communication port adapter and distribution modules, and *SureServo* 50-pin I/O interface connection.

Using the **ZIPLink Specialty Modules** selector table located in this section,

1. Locate the type of application.
2. Select a ZIPLink module.



Solution 6: ZIPLink Connector Modules to 3rd Party Devices

If you need a way to connect your device to terminal blocks without all that wiring time, then our pigtail cables with color-coded soldered-tip wires are a good solution. Used in conjunction with any compatible ZIPLink Connector Modules, a pigtail cable keeps wiring clean and easy and reduces troubleshooting time.

Using the **Universal Connector Modules and Pigtail Cables** table located in this section,

1. Select module type.
2. Select the number of pins.
3. Select cable.



PLC I/O Modules to ZIPLink Connector Modules - DL305

DL305 PLC Input Module ZIPLink Selector				
PLC		ZIPLink		
Input Module	# of Terms	Component	Module Part No.	Cable Part No.
D3-08ND2 ¹	10	See Note 1		
D3-16ND2-1	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
D3-16ND2F	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
D3-16ND3F	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
D3-08NA-1 ¹	10	See Note 1		
D3-08NA-2 ¹	10	See Note 1		
D3-16NA	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
D3-08NE3 ¹	10	See Note 1		
D3-16NE3	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
		Sensor	ZL-LTB16-24	ZL-D3-CBL18*

DL305 PLC Analog Module ZIPLink Selector				
PLC		ZIPLink		
Analog Module	# of Terms	Component	Module	Cable
F3-04ADS	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
F3-08AD-1	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
F3-16AD	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
F3-04DA-1	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
F3-04DAS	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
F3-08THM-J ³	T/C Wire Only	See Note 3		
F3-08THM-K ³	T/C Wire Only	See Note 3		



NOTE: ZIPLINK CONNECTOR MODULES SPECIFICATIONS FOLLOW THE COMPATIBILITY MATRIX TABLES. ZIPLINK CABLES SPECIFICATIONS ARE AT THE END OF THIS ZIPLINK SECTION.



DL305 PLC Output Module ZIPLink Selector				
PLC		ZIPLink		
Output Module	# of Terms	Component	Module Part No.	Cable Part No.
D3-04TD1 ¹	10	See Note 1		
D3-08TD1 ¹	10	See Note 1		
D3-08TD2 ¹	10	See Note 1		
D3-16TD1-1	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
		Fuse	ZL-RFU20 ⁴	ZL-D3-CBL18*
		Relay (sinking)	ZL-RRL16-24-1	ZL-D3-CBL18*
D3-16TD2	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
		Fuse	ZL-RFU20 ⁴	ZL-D3-CBL18*
		Relay (sourcing)	ZL-RRL16-24-2	ZL-D3-CBL18*
D3-04TAS ¹	10	See Note 1		
F3-08TAS-1	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
D3-08TA-1	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
D3-08TA-2 ¹	10	See Note 1		
F3-16TA-2	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
		Fuse	ZL-RFU20 ⁴	ZL-D3-CBL18*
D3-16TA-2	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
		Fuse	ZL-RFU20 ⁴	ZL-D3-CBL18*
D3-08TR ¹	10	See Note 1		
D3-16TR ²	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
		Fuse	ZL-RFU20 ⁴	ZL-D3-CBL18*
F3-08TRS-1 ²	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*
F3-08TRS-2 ²	18	Feedthrough	ZL-RTB20	ZL-D3-CBL18*

* Select the cable length by replacing the * with: Blank = 0.5m, -1 = 1.0m, or -2 = 2.0m.

¹ These I/O modules have non-removable terminal blocks which can be terminated using the ZL-CBL24-1P or 2P pigtail cable and the ZL-RTB20 module of the ZIPLink wiring system.

² Caution: The D3-16TR, F3-08TRS-1 and F3-08TRS-2 relay outputs are derated not to exceed 2A per point and 4A per common when used with the ZIPLink wiring system.

³ The F3-08THM-J and F3-08THM-K modules are not supported by the ZIPLink wiring system.

⁴ Note: Fuses (5 x 20 mm) are not included. See Edison Electronic Fuse section for (5 x 20 mm) fuse. S500 and GMA electronic circuit protection for fast-acting maximum protection. S506 and GMC electronic circuit protection for time-delay performance. Ideal for inductive circuits.

To ensure proper operation, do not exceed the voltage and current rating of ZIPLink module. ZL-RFU20 = 2A per circuit; ZL-RFU40 = 400 mA per circuit.