



MDR 3 Type with
Integral Thermal Overload



MDR 21 Type
Pressure Switch

Air Compressor and Pump Switches *Table of Contents*

MDR3 Series Pressure Switches

General Information	390
Air Compressor Switches	391
Pump Switches	392

MDR21 Series Pressure Switches

General Information	393
Switches and Accessories	393

Combination Pressure Switch with Integral Overload Relay

The **MDR3 Series Combination Pressure Switch** with Integral Overload Relay offers a simple, straight forward way of directly controlling the compressor or pump motor and providing overload motor protection, without the need of a separate motor starter. This Patented Pressure Switch offers an industry first - an Integral Thermal Overload which has been incorporated into the pressure switch to prevent an overloaded condition from burning out the compressor or pump motor. The unique combination of the reliable **Advance Controls** Pressure Switch and an integral thermal overload allows the MDR3 to replace old fashioned separate pressure switch / starter combinations. It is UL Listed (UL 508) to start and stop a single or three phase compressor / pump motor directly across the line. No other device or method of controlling a compressor pump motor offers the flexibility, cost savings, compact size and value as does the MDR3 Series Combination Pressure Switch with *Integral* Overload Relay.



Patented

- Combines functions of both a pressure switch and a motor starter
- Wide variety of factory pressure settings
- Integral adjustable motor overload
- "Off / Auto" switch on cover - standard
- Unloader valve - standard on air compressor switches
- Four way flange available
- Oversized inlet ports available

Ordering Information:

Order the **Advance Controls MDR3 Series Pressure Switch** by the **Catalog Number** as shown in the MDR3 Pressure Switch Selection Tables

- 1) Determine the Factory Pressure Setting required.
- 2) Determine the Motor Horsepower or the Full Load Amps of the motor.
- 3) Select the needed MDR3 Pressure Switch. In all cases, the Motor Full Load Amps must be within the "Overload Amp Range" as shown in the selection table.
- 4) Select any required Accessories or Options.

Combination Pressure Switch with Adjustable Overload

Air Compressor Switch with "Off / Auto" Selector and Unloader Valve

FACTORY PRESSURE SETTING	CATALOG NUMBER	OVERLOAD RANGE (Amp)	MOTOR HORSEPOWER						WT Lbs	LIST PRICE
			SINGLE PHASE		THREE PHASE					
			120	230	200	230	460	575		
70 - 100 (PSI)	115882	0.63 - 1.0	-	-	-	-	1/2	1/2	1.1	\$114
	114721	1.0 - 1.6	-	1/10	1/3	1/3	3/4	1	1.1	\$114
	114722	1.6 - 2.5	-	1/6	1/2	1/2	1	1.5	1.1	\$114
	114723	2.5 - 4.0	1/8	1/3	3/4	1	2	3	1.1	\$114
	114724	4.0 - 6.3	1/4	1/2	1.5	1.5	3	5	1.1	\$114
	114720	6.3 - 10	1/2	1.5	2	3	5	7.5	1.1	\$114
	114726	10 - 16	1	2	3	5	10	10	1.1	\$119
	114727	16 - 20	1.5	3	-	-	-	15	1.1	\$119
	114728	20 - 24	2	-	7.5	7.5	15	20	1.1	\$123
114729	24 - 30	2	5	-	-	-	-	1.1	\$123	
80 - 100 (PSI)	115883	0.63 - 1.0	-	-	-	-	1/2	1/2	1.1	\$114
	115884	1.0 - 1.6	-	1/10	1/3	1/3	3/4	1	1.1	\$114
	115885	1.6 - 2.5	-	1/6	1/2	1/2	1	1.5	1.1	\$114
	115509	2.5 - 4.0	1/8	1/3	3/4	1	2	3	1.1	\$114
	115542	4.0 - 6.3	1/4	1/2	1.5	1.5	3	5	1.1	\$114
	115543	6.3 - 10	1/2	1.5	2	3	5	7.5	1.1	\$114
	115544	10 - 16	1	2	3	5	10	10	1.1	\$119
	115545	16 - 20	1.5	3	-	-	-	15	1.1	\$119
	115886	20 - 24	2	-	7.5	7.5	15	20	1.1	\$123
115546	24 - 30	2	5	-	-	-	-	1.1	\$123	
95 - 125 (PSI)	114730	0.63 - 1.0	-	-	-	-	1/2	1/2	1.1	\$114
	114731	1.0 - 1.6	-	1/10	1/3	1/3	3/4	1	1.1	\$114
	114732	1.6 - 2.5	-	1/6	1/2	1/2	1	1.5	1.1	\$114
	114733	2.5 - 4.0	1/8	1/3	3/4	1	2	3	1.1	\$114
	113512	4.0 - 6.3	1/4	1/2	1.5	1.5	3	5	1.1	\$114
	114735	6.3 - 10	1/2	1.5	2	3	5	7.5	1.1	\$114
	112136	10 - 16	1	2	3	5	10	10	1.1	\$119
	113513	16 - 20	1.5	3	-	-	-	15	1.1	\$119
	109155	20 - 24	2	-	7.5	7.5	15	20	1.1	\$123
109154	24 - 30	2	5	-	-	-	-	1.1	\$123	
145 - 175 (PSI)	114736	0.63 - 1.0	-	-	-	-	1/2	1/2	1.1	\$119
	114737	1.0 - 1.6	-	1/10	1/3	1/3	3/4	1	1.1	\$119
	114738	1.6 - 2.5	-	1/6	1/2	1/2	1	1.5	1.1	\$119
	114739	2.5 - 4.0	1/8	1/3	3/4	1	2	3	1.1	\$119
	114740	4.0 - 6.3	1/4	1/2	1.5	1.5	3	5	1.1	\$119
	111600	6.3 - 10	1/2	1.5	2	3	5	7.5	1.1	\$119
	111870	10 - 16	1	2	3	5	10	10	1.1	\$124
	114741	16 - 20	1.5	3	-	-	-	15	1.1	\$124
	114742	20 - 24	2	-	7.5	7.5	15	20	1.1	\$128
111881	24 - 30	2	5	-	-	-	-	1.1	\$128	

Accessories

CATALOG NUMBER	DESCRIPTION	WT Lbs	LIST PRICE
104007	UNLOADER VALVE - FOR 1/4" COPPER TUBING	0.1	\$6
104008	UNLOADER VALVE - FOR 1/4" PLASTIC TUBING	0.1	\$6

Note: Consult factory for 4-way flange or oversized inlet ports.

Combination Pressure Switch with Adjustable Overload

Pump Switch with "Off / Auto" Selector

FACTORY PRESSURE SETTING	CATALOG NUMBER	OVERLOAD RANGE (Amp)	MOTOR HORSEPOWER						WT Lbs	LIST PRICE
			SINGLE PHASE		THREE PHASE					
			120	230	200	230	460	575		
20 - 40 (PSI)	115479	0.63 - 1.0	-	-	-	-	1/2	1/2	1.1	\$114
	115480	1.0 - 1.6	-	1/10	1/3	1/3	3/4	1	1.1	\$114
	115481	1.6 - 2.5	-	1/6	1/2	1/2	1	1.5	1.1	\$114
	115482	2.5 - 4.0	1/8	1/3	3/4	1	2	3	1.1	\$114
	115483	4.0 - 6.3	1/4	1/2	1.5	1.5	3	5	1.1	\$114
	115484	6.3 - 10	1/2	1.5	2	3	5	7.5	1.1	\$114
	115485	10 - 16	1	2	3	5	10	10	1.1	\$119
	115486	16 - 20	1.5	3	-	-	-	15	1.1	\$119
	115487	20 - 24	2	-	7.5	7.5	15	20	1.1	\$123
115488	24 - 30	2	5	-	-	-	-	1.1	\$123	
30 - 50 (PSI)	115489	0.63 - 1.0	-	-	-	-	1/2	1/2	1.1	\$114
	115490	1.0 - 1.6	-	1/10	1/3	1/3	3/4	1	1.1	\$114
	115491	1.6 - 2.5	-	1/6	1/2	1/2	1	1.5	1.1	\$114
	115492	2.5 - 4.0	1/8	1/3	3/4	1	2	3	1.1	\$114
	115493	4.0 - 6.3	1/4	1/2	1.5	1.5	3	5	1.1	\$114
	115494	6.3 - 10	1/2	1.5	2	3	5	7.5	1.1	\$114
	115495	10 - 16	1	2	3	5	10	10	1.1	\$119
	115496	16 - 20	1.5	3	-	-	-	15	1.1	\$119
	115497	20 - 24	2	-	7.5	7.5	15	20	1.1	\$123
115498	24 - 30	2	5	-	-	-	-	1.1	\$123	
40 - 60 (PSI)	115499	0.63 - 1.0	-	-	-	-	1/2	1/2	1.1	\$114
	115500	1.0 - 1.6	-	1/10	1/3	1/3	3/4	1	1.1	\$114
	115501	1.6 - 2.5	-	1/6	1/2	1/2	1	1.5	1.1	\$114
	115502	2.5 - 4.0	1/8	1/3	3/4	1	2	3	1.1	\$114
	111790	4.0 - 6.3	1/4	1/2	1.5	1.5	3	5	1.1	\$114
	111791	6.3 - 10	1/2	1.5	2	3	5	7.5	1.1	\$114
	115503	10 - 16	1	2	3	5	10	10	1.1	\$119
	115504	16 - 20	1.5	3	-	-	-	15	1.1	\$119
	115505	20 - 24	2	-	7.5	7.5	15	20	1.1	\$123
115506	24 - 30	2	5	-	-	-	-	1.1	\$123	

Note: Consult factory for 4-way flange or oversized inlet ports.

Accessories

CATALOG NUMBER	DESCRIPTION	WT Lbs	LIST PRICE
104007	UNLOADER VALVE - FOR 1/4" COPPER TUBING	0.1	\$6
104008	UNLOADER VALVE - FOR 1/4" PLASTIC TUBING	0.1	\$6

Note: Consult factory for 4-way flange or oversized inlet ports.

General Purpose Pressure Switch

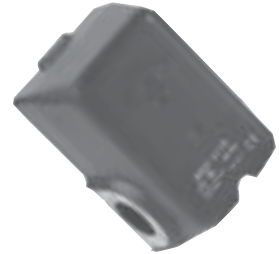
Advance Controls' MDR21 Series Switches provides for automatic operation of pumps and compressors. The switch is activated by the required tank pressure. This 2 pole switch is suitable to operate a 1 phase motor at the allowable ratings. The switch will control larger 1 phase and all 3 phase motors by using an ACI motor starter. Please see pages 57 - 67 for ACI motor starters.

Ratings:

General Purpose: 20 Amps Motor HP: 1Phase @ 120V = 1.5 HP, 230V = 3 HP

Ordering Information:

- 1) Select the required factory set Pressure Range
- 2) Select the required factory installed Options
- 3) Order by the **Catalog Number**



Air Compressor Switches

70 - 100 PSI		
CATALOG NUMBER	WT Lbs	LIST PRICE

Basic Switch

104047	0.8	\$41
--------	-----	------

Switch with Unloader Valve

112676	0.8	\$47
--------	-----	------

Switch with "Off / Auto" Cover

112679	0.8	\$47
--------	-----	------

Switches with Unloader Valve and "Off / Auto" Cover

112681	0.8	\$53
--------	-----	------

95 - 125 PSI		
CATALOG NUMBER	WT Lbs	LIST PRICE

Basic Switch

104027	0.8	\$41
--------	-----	------

Switch with Unloader Valve

104028	0.8	\$47
--------	-----	------

Switch with "Off / Auto" Cover

104034	0.8	\$47
--------	-----	------

Switches with Unloader Valve and "Off / Auto" Cover

112682	0.8	\$53
--------	-----	------

145 - 175 PSI		
CATALOG NUMBER	WT Lbs	LIST PRICE

Basic Switch

104038	0.8	\$46
--------	-----	------

Switch with Unloader Valve

112678	0.8	\$52
--------	-----	------

Switch with "Off / Auto" Cover

112680	0.8	\$52
--------	-----	------

Switches with Unloader Valve and "Off / Auto" Cover

112683	0.8	\$58
--------	-----	------

Pump Switches

20 - 40 PSI		
CATALOG NUMBER	WT Lbs	LIST PRICE

Basic Switch

104043	0.8	\$41
--------	-----	------

Switch with "Off / Auto" Cover

112684	0.8	\$47
--------	-----	------

30 - 50 PSI		
CATALOG NUMBER	WT Lbs	LIST PRICE

Basic Switch

104045	0.8	\$41
--------	-----	------

Switch with "Off / Auto" Cover

112685	0.8	\$47
--------	-----	------

40 - 60 PSI		
CATALOG NUMBER	WT Lbs	LIST PRICE

Basic Switch

104046	0.8	\$41
--------	-----	------

Switch with "Off / Auto" Cover

112686	0.8	\$47
--------	-----	------

Unloader Valve: Valve discharges compressed air trapped in exhaust tube when the compressor stops. This allows unloaded compressor restarts. Field installed.

Off / Auto Cover: Cover allows "Off/ Auto" operation of the pump or compressor. Field installed.

Screw Style for 1/4" copper tube

CATALOG NUMBER	WT Lbs	LIST PRICE
----------------	--------	------------

Screw Style for 1/4" copper tube

104005	0.8	\$6
104007	0.8	\$6

Push-on type for 1/4" plastic tube

104008	0.8	\$6
--------	-----	-----



CATALOG NUMBER	WT Lbs	LIST PRICE
104001	0.5	\$6.00

Four Way Flange: 4 openings each tapped 1/4" NPT. Allows installation of items such as pressure gauges, relief valves and discharge valves into the pressure switch base. This option minimizes the openings into the air receiver.

Factory Installed Only.

This Page Intentionally Left Blank
<< Previous Page | Next Page >>

A

Accessories

- Cam Switch 32
- Contactors
 - Auxiliary Contact Blocks 53
 - Coil Driver 53
 - Coil Surge Suppressor 54
 - Contact Marking Tags 54
 - Mechanical Interlocks 53
 - Noise Filter 54
 - Overload Independent Mounting Base 52
 - Start Switch 53
 - Terminal Commoning Bar 54
 - Terminal Lug Kit 54
 - Thermal Overload Relays 52
- Industrial Control Devices 133
 - 22 mm & 30 mm Non-Metallic 156
 - 22 mm Metallic 139
 - 30 mm Metallic 149
 - B Series 22 mm Metallic 133
 - Pendant Stations 161
- Limit Switches 210
- Load Break Disconnect Switch 120
- Manual Motor Starters 108
- Pressure Switches 391
- Safety Switches
 - Replacement Keys 200
- Terminal Blocks
 - Barrier Plate 340, 372
 - DIN Rail 339, 363, 385
 - DIN Rail Mounting Brackets 339, 363
 - End Covers 340, 364, 380
 - End Stops 339, 363
 - End Support 371
 - Ferrule Crimping Tools 345
 - Ferrules - Insulated 345
 - Insulation Displacement Type 359
 - Jumpers 341, 369, 380
 - K Series 339
 - M Series 339
 - Marking Pens 366
 - Marking Tag Holders 367
 - Marking Tags 342, 365, 379
 - Partition Plate 340, 372, 380
 - Safety Cover 371
 - Terminal Strip Cover 370
 - Test Plug 380
 - Test Plugs and Sockets 371
 - U Series 339
 - Warning Plate 368

Air Compressor Switches 389. See also Pressure Switches

Ammeter Switch 29 Approvals

- Cam Switch 13
- Industrial Control Devices
 - 22 mm & 30 mm Non-Metallic 151
 - 22 mm Metallic 135
 - 30 mm Metallic 143
 - B Series 22 mm Metallic 130
 - Pendant Stations 159
- Inverter Bypass Safety Switch 3
- Limit Switches 210
 - Rope Operated 208
- Power Supplies 326
- Safety Switches
 - Hinge Operated 190
 - Key Operated 184
 - Key Operated Manual Mechanical Delay 188
 - Key Operated Solenoid Release 186
 - Rope Operated 194, 196
 - Slotted Lever Operated 192
- Terminal Blocks
 - K Series 330
 - Standard Series 344
 - Standard Series - Sping-Clamp Style 373

Automotive Relays 167

B

Bypass Switch

- Inverter 1. See also Inverter Bypass Safety Switch

C

Cable Connectors 299

- 1/2 - 20 Micro Style
 - 3 pin, 3 wire Threaded 315
 - 4 pin, 4 wire Threaded 316
 - 5 pin, 5 wire Threaded 317
 - Bulkhead Receptacles 318

7/8 - 16 Mini Style

- 2 pin, 2 wire Threaded 319
- 3 pin, 3 wire Threaded 320
- 4 pin, 4 wire Threaded 321
- 5 pin, 5 wire Threaded 322
- Bulkhead Receptacles 323

Extension Cable Assemblies 324

M-12 Micro Style AC

- 3 pin, 3 wire Threaded 312
- 4 pin, 3 wire Threaded 312
- 5 pin, 5 wire Threaded 313
- Bulk Head Receptacles 314

M-12 Micro Style DC

- 4 pin, 3 wire Threaded 307
- 4 pin, 4 wire Threaded 308
- 5 pin, 5 wire Threaded 309
- Bulk Head Receptacles 310

M-8 Pico Style

- 3 pin, 3 wire Snap Style 302
- 3 pin, 3 wire Threaded 300
- 4 pin, 4 wire Snap Style 303
- 4 pin, 4 wire Threaded 301
- Bulk Head Receptacles 304
- Male Inserts - Snap Style 305
- Male Inserts PCB Mount 306

Cable Glands

- AG and EG Series 387
- CG and PG Series 386
- NPT Series 386

Cam Switch 11

- Accessories 32
- Ammeter Switch 29
- Boat Hoist (Enclosed) 23
- Davit Switch (Enclosed) 23
- Double Throw 26
- Drum Switch (Enclosed) 22
- Enclosures 33
- High Pressure Washer 24
- Load Break with Door Interlock 18
- Motor Reversing 20
 - Key Operated 21
- Multi-Step 28
- Off / On Switch
 - Enclosed 17
 - Key Operated 16
 - Open Switch 14
- Power Transfer 31
- Two Speed, Three Phase Motor 25
- Volt Meter 30
- Voltage Changeover 31

Certifications. See Approvals

Contact Blocks

- B Series 22 mm Metallic 133
- for 22 mm & 30 mm Non-Metallic 156
- for 22 mm Metallic 139
- for 30 mm Metallic 149

Contact Control

- Inverter Bypass Safety Switch 3, 8

Contactors 37

- Accessories 52
 - Auxiliary Contact Blocks 53
 - Coil Driver 53
 - Coil Surge Suppressor 54
 - Contact Marking Tags 54
 - Mechanical Interlocks 53
 - Noise Filter 54
 - Overload Independent Mounting Base 52
 - Start Switch 53
 - Terminal Commoning Bar 54
 - Terminal Covers 54
 - Terminal Lug Kit 54
 - Thermal Overload Relays 52

BF to C Series Conversion 110

- Dimensions 95
- Features 38
- General Information 38
- Non-Reversing AC Coil

- C06 Mini 39
- C09 40
- C12 40
- C16 41
- C160 / C200 / C250 / C320 42
- C23 / C28 41
- C32 / C40 41
- C50 / C65 / C80 42
- C95 / C105 / C130 42

Non-Reversing DC Coil

- C06 Mini 43
- C09 44
- C12 44
- C16 44
- C160 / C200 / C250 / C320 45
- C23 / C28 44
- C32 / C40 45
- C50 / C65 / C80 45
- C95 / C105 / C130 45

Replacement Parts 90

- Coils 90
- Contact Kits 91

Reversing AC Coil

- C06 Mini - Single Phase 46
- C06 Mini - Three Phase 47
- C09 / C12 / C16 Single Phase 46
- C09 / C12 / C16 Three Phase 47
- C160 / C200 / C250 / C320 Three Phase 48
- C23 / C28 / C32 / C40 Single Phase 46
- C23 / C28 Three Phase 47
- C32 / C40 Three Phase 47
- C50 / C65 / C80 Single Phase 46
- C50 / C65 / C80 Three Phase 48
- C95 / C105 / C130 Three Phase 48

Reversing DC Coil

- C06 Mini - Single Phase 49
- C06 Mini - Three Phase 50
- C09 / C12 / C16 49
- C09 / C12 / C16 - Three Phase 50
- C23 / C28 / C32 / C40 Single Phase 49
- C23 / C28 Three Phase 50
- C32 / C40 Three Phase 50

Technical Data 92

D

Davit Switch (Enclosed) 23

- Dimensions
 - Cable Glands 386
 - Compact Starter Enclosures 58
 - Contactors 95
 - Enclosures 384
 - Handle Assembly
 - Cam Switch 35
 - Industrial Control Devices
 - 22 mm & 30 mm Non-Metallic Operators 157
 - 22 mm Metallic Operators 142
 - 30 mm Metallic Operators 150
 - 30 mm Pushbutton Control Stations 148
 - Miniature Indicating Lights 158
 - Pendant Stations 162
 - Inverter Bypass Safety Switch 9
 - Load Break Cam Switch 19
 - Load Break Disconnect Switch 122
 - Manual Motor Starters 109
 - Photoelectric Sensors
 - 18 mm Tubular 273
 - MP Series Rectangular 288
 - Power Supplies 327
 - Reversing Contactors 97
 - Reversing Starters 103
 - Starter Enclosures 55, 89
 - Starters 100

DIN Rail 385

- Mounting Adaptor
 - Power Supplies 326

Direct Control

- Inverter Bypass Safety Switch 3, 4, 5
 - with Motor Overload Protection 5
- Double Throw Cam Switch 26

Drilling Templates

- Handle Assembly
 - Cam Switch 35

Drive Transfer Switch 10

Drum Switch (Enclosed) 22

Duplex Pump Panels 113

Dust Cover

- Cam Switch 32

E

Emergency Stop

- Pushbutton Stations 200
- Enclosed Power Supplies. See Power Supplies

Enclosures 382

- Cam Switch 33
- Dimensions 384
- DIN Mounting Rail 385
- DIN Rail 383
- Manual Motor Starters 108
- Mounting Foot 383
- Mounting Plate 382
- Pendant Stations 161
- Pushbutton Control Station 134, 141
- Starter Enclosures 55
 - Dimensions 55, 89

F

Face Plate

- Cam Switch, Locking 32

Features

- Contactors 38
- Inverter Bypass Safety Switch 3
- Load Break Disconnect Switch 116
- Overload Relays 38
- Terminal Blocks
 - K Series 330
 - Standard Series 344
 - Standard Series - Sping-Clamp Style 373

Forms

- Pendant Stations Layout Worksheet 163

Fuse Blocks 123

- for Class CC (Rejection) Type 128
- for Class J 128
- for Midget Type 128

Fuses 123

- Class CC 124
- Class J 127
- Fast Acting
 - Type JLS 127
 - Type KLK 126
- Midget 125
- Rejection Type
 - Fast Acting - Type KLK-R 124
 - Time Delay - Type CCMR 124
- Sizing Guide 126
- Time Delay
 - Type FLM 125
 - Type FLO 125
 - Type JTD 127



It's a different bird®
THE IBYSS

G

- Gaskets**
- Cam Switch 33
- General Information**
- Cam Switch 12
- Contactors 38
- Industrial Control Devices
 - 22 mm & 30 mm Non-Metallic 151
 - 22 mm Metallic 135
 - 30 mm Metallic 143
 - B Series 22 mm Metallic 130
 - Pendant Stations 159
- Inverter Bypass Safety Switch 2
- Limit Switches 202
 - Rope Operated 209
- Load Break Disconnect Switch 116
- Manual Motor Starters 106
- Overload Relays 38
- Photoelectric Sensors 270
- Power Supplies 326
- Pressure Switches 390
- Proximity Sensors
 - Capacitive 218
 - Inductive 214
 - NAMUR 217
- Safety Switches**
 - Hinge Operated 190
 - Key Operated 184
 - Key Operated Manual Mechanical Delay 188
 - Key Operated Solenoid Release 186
 - Rope Operated 194, 196
 - Slotted Lever Operated 192
- Terminal Blocks**
 - K Series 330
 - Standard Series 344
 - Standard Series - Sping-Clamp Style 373

H

- Handle Assembly**
- Cam Switch
 - Double Throw 28
 - Motor Reversing 21
 - Off / On Switch 16
 - PL Style 34
 - R Style 34
- Inverter Bypass Safety Switch 4
- Load Break Disconnect Switch 118
- Heavy Duty Relays 173**
- High Pressure Washer Switch 24**
- Hinge Operated Safety Switches 190**

I

- IBYSS®. See Inverter Bypass Safety Switch**
- Industrial Cam Switch. See Cam Switch**
- Industrial Control Devices 129**
 - 22 mm & 30 mm Non-Metallic
 - Approvals 151
 - Contact Blocks 156
 - Dimensions 157
 - General Information 151
 - Lamp Holders 156
 - Lamps 156
 - Legend Plates 157
 - Technical Data 151
 - 22 mm Metallic
 - Approvals 135
 - Contact Blocks 139
 - Contact Operation Diagram 137
 - Dimensions 142
 - General Information 135
 - Illuminated Pushbuttons 138
 - Illuminated Selector Switches 138
 - Lamp Holders 139, 140
 - Lamps 140
 - Legend Plates 142
 - Non-Illuminated Key Style Selector Switch 137
 - Non-Illuminated Knob Style Selector Switch 137
 - Non-Illuminated Pushbuttons 136
 - Pilot Lights 138
 - Pushbutton Control Station Enclosure 141
 - Pushbutton Control Stations 141
 - Technical Data 135

- 22 mm Non-Metallic
 - Illuminated Pushbuttons 153
 - Non-Illuminated Key Style Selector Switch 155
 - Non-Illuminated Knob Style Selector Switch 154
 - Non-Illuminated Pushbuttons 153
 - Pilot Lights 154
 - Pushbutton Control Station Enclosure 155
 - Pushbutton Control Stations 155
- 30 mm Metallic
 - Approvals 143
 - Contact Blocks 149
 - Dimensions 150
 - General Information 143
 - Illuminated Knob Style Selector Switch 146
 - Lamp Holders 149
 - Lamps 149
 - Legend Plates 150
 - Non-Illuminated Key Style Selector Switch 147
 - Non-Illuminated Knob Style Selector Switch 146
 - Non-Illuminated Pushbuttons 144
 - Pushbutton Control Stations 148
 - Technical Data 143
- 30 mm Non-Metallic
 - Illuminated Pushbuttons 152
 - Non-Illuminated Key Style Selector Switch 152
 - Non-Illuminated Knob Style Selector Switch 152
 - Non-Illuminated Pushbuttons 152
- Accessories**
 - 22 mm & 30 mm Non-Metallic 156
 - 22 mm Metallic 139
 - 30 mm Metallic 149
 - B Series 22 mm Metallic 133
 - Pendant Stations 161
- B Series 22 mm Metallic**
 - Approvals 130
 - Contact Blocks 133
 - General Information 130
 - Illuminated Pushbuttons 132
 - Illuminated Selector Switches 133
 - Non-Illuminated Key Style Selector Switch 131
 - Non-Illuminated Knob Style Selector Switch 132
 - Non-Illuminated Pushbuttons 131
 - Pilot Lights 132
 - Pushbutton Control Station Enclosure 134
 - Pushbutton Control Stations 134
 - Technical Data 130
- Contact Blocks**
 - Pendant Stations 161
- Miniature Indicating Lights 158**
 - Mounting / Dimensions 158
- Pendant Stations 160**
 - Accessories 161
 - Approvals 159
 - Dimensions 162
 - General Information 159
 - Layout Worksheet Form 163
 - Legend Plates 162
 - Technical Data 159
- Replacement Parts**
 - 22 mm & 30 mm Non-Metallic 156
 - 22 mm Metallic 139
 - 30 mm Metallic 149
 - B Series 22 mm Metallic 133
- Industrial Control Relays 56. See Relays: Industrial Control**
- Industrial Relays 171**
- Inverter Bypass Safety Switch**
 - Approvals 3
 - Certifications. See Approvals
 - Contact Control
 - Open Switch 3
 - Dimensions 9
 - Direct Control
 - Open Switch 3
 - Features 3
 - General Information 2
 - Handle Assembly for Open Switch 4
 - Open Switch 3
 - Operation 2
 - Options 9
 - Technical Data - UL508 3

K

- Key Operated**
- Motor Reversing Switch 21
- Mushroom Head Pushbutton
 - 22 mm Metallic 136
- Off / On Cam Switch 16
- Safety Switches 184**
 - Manual Mechanical Delay 188
 - Replacement Keys 200
 - Solenoid Release 186
- Selector Switches**
 - 22 mm Metallic 137
 - 22 mm Non-Metallic 155
 - 30 mm Metallic 147
 - 30 mm Non-Metallic 152
 - 75 Series for Pendant Stations 161
 - B Series 22 mm Metallic 131
- Knob. See Handle Assembly Knob Style**
- Selector Switches - Illuminated**
 - 22 mm Metallic 138
 - 30 mm Metallic 146
 - B Series 22 mm Metallic 133

L

- Limit Switches 201**
 - Accessories 210
 - Approvals 210
 - Contact Block Diagrams
 - Configuration 211
 - Operation 211
 - General Information 202
 - Ratings 210
 - Replacement Parts 210
 - Rod Plunger 204, 205
 - Cat's Whisker 205
 - Fiberglass 207
 - Flexible Fiberglass 205
 - Long 204
 - Spring 205
 - Steel - Round 206
 - Steel - Square 206
 - Roller Lever**
 - Adjustable 206
 - Centered 207
 - Offset 206
 - Straight 207
 - Two Arm 207
 - Roller Plunger 204**
 - Direct 205
 - Offset 204
 - Straight 204
 - Rope Operated**
 - Approvals 208
 - Technical Data 208
 - Top Entrance 208
 - Technical Data 210
- Liquid Tight Cable Glands. See Cable Glands**
- Load Break**
 - Cam Switch with Door Interlock 18
 - Safety Switch 199
- Load Break Disconnect Switch 115**
 - Accessories 120
 - Class CC Fuses / Fuse Blocks 121
 - Dimensions 122
 - Enclosed Switches 119
 - Features 116
 - Fused 117
 - General Information 116
 - Handle Assembly 118
 - Non-Fusible 117
 - Open Switches 117
 - Ratings 117
 - Safety Switch 199
 - Spare Parts 120

M

- Manual Motor Starters 37, 106**
 - Accessories 108
 - Dimensions 109
 - Enclosures 108
 - Technical Data 107
- Motor Reversing Cam Switch 20**
- Motor Starting Relays 176**
- Motor Transfer Switch 10**
- Mounting Base**
 - Cam Switch - Rear Mount 32
- Mounting Rail 385**
- MSM Series 106. See Manual Motor Starters**
- Multi Function Timers 177**
- Multi-Step Cam Switch 28**

N

- Non-Metallic Enclosures. See Enclosures**

O

- Off / On Switch**
 - Enclosed 17
 - Open Switch 14
- Off Delay Timers 180**
- On Delay Timers 178**
- Open Switch**
 - Inverter Bypass Safety Switch 2
- Operation**
 - Inverter Bypass Safety Switch 2
- Options**
 - Inverter Bypass Safety Switch 9
- Overload Relays. See Relays: Overload**

P

- Photoelectric Sensors 269**
 - 18 mm Tubular 272
 - Dimensions 273
 - Technical Data 273
 - Wiring Diagrams 274
- Cable Connectors. See Cable Connectors**
- EP Series Rectangular**
 - Convergent 294
 - Diffuse 292
 - Retro-Reflective 291
 - Technical Data 297
 - Through Beam 296
 - Wiring Diagrams 298
- General Information 270**
- MP Series Rectangular**
 - Convergent 283
 - Diffuse 275
 - Dimensions 288
 - Retro-Reflective 278
 - Technical Data 289
 - Through Beam 280
 - Wiring Diagrams 290
- Pilot Lights. See Industrial Control Devices**
- Power Off Delay Timers 180**
- Power On Delay Timers 178**
- Power Supplies 325**
 - Approvals 326
 - Dimensions 327
 - DIN Rail Mounting Adaptor 326
 - Features 326
 - General Information 326
 - Technical Data 327
- Power Transfer Switch 31**
- Pressure Switches 389**
 - Air Compressor 393
 - Combination with Adjustable Overload 391
 - Accessories 391
 - General Information 390
 - General Purpose 393
 - Pump Switches 393
 - Unloader Valve 393

Proximity Sensors 213
 Cable Connection Diagrams 265
 Cable Connectors. *See* Cable Connectors
Capacitive
 12 mm Tubular 254
 18 mm Tubular 255
 30 mm Tubular 257
 34 mm Tubular 259
 40 mm Tubular 259
 General Information 218
Inductive
 12 and 16 mm Rectangular 249
 12 mm Tubular 227
 18 mm Rectangular 250
 18 mm Tubular 232
 25 mm Rectangular 252
 30 mm Tubular 240
 4 and 5 mm Tubular 222
 40 mm Tubular 246
 6.5 mm Tubular 223
 8 mm Rectangular 247
 8 mm Tubular 224
 General Information 214
 Q40 Limit Switch Style 253
NAMUR
 8 to 30 mm Tubular 261
 Control Unit 263
 General Information 217
Specialty 268
 Wiring Diagrams 264
Pump Control Panels
 Duplex 113
 Simplex 111
Pump Switches 389. *See also* Pressure Switches

R

Ratings
 Limit Switches 210
 Load Break Disconnect Switch 117
 Pressure Switches 393
Relays 165
 Automotive
 92 Series 167
 General Purpose Industrial
 95 Series 171
 96 Series 172
 Heavy Duty Industrial
 97 Series 173
 98 Series 174
 99 Series 175
 Industrial Control 37, 56
 Motor Starting
 100 Series 176
 Overload 37, 52
 Printed Circuit Board
 90 Series 166
 93 Series 168
 94 Series 169
 Safety Control 198
 Sockets 181
Replacement Parts
 Contactors
 Coils 90
 Contact Kits 91
 Industrial Control Devices
 22 mm & 30 mm Non-Metallic 156
 22 mm Metallic 139
 30 mm Metallic 149
 B Series 22 mm Metallic 133
 Pendant Stations 161
 Limit Switches 210
 Load Break Disconnect Switch 120
 Safety Switch Keys 200
Rope Operated
 Safety Switches 194, 196

S

Safety Control Relays 198
Safety Switches 183
 Enclosed
 Load Break Disconnect 199
 Hinge Operated 190
 Inverter Bypass 1
 Key Operated 184
 Manual Mechanical Delay 188
 Replacement Keys 200
 Solenoid Release 186
 Rope Operated 194, 196
 Slotted Lever Operated 192
Selector Switches. *See* Industrial Control Devices
Sensors
 Photoelectric. *See* Photoelectric Sensors
 Proximity. *See* Proximity Sensors
Simplex Pump Panels 111
Slotted Lever Operated
 Safety Switches 192
Sockets 165, 181
Spare Parts. *See* Replacement Parts
Starter Control
 Inverter Bypass Safety Switch with Motor Overload Protection 6, 7
Starters 37
 C Series
 Part Winding 87
 Single Phase 60
 Three Phase 62
 Wye Delta 86
 C Series Combination 74
 C Series Reversing
 Single Phase 68
 Three Phase 70
 Compact Enclosed 58
 Dimensions 101
 Factory Installed Modifications 88
 Manual Motor 37, 106
 Mini Enclosed 57
 Replacement Parts 90
 Separate Enclosures 55
Strain Relief Cable Glands 386
Switching Power Supplies. *See* Power Supplies

T

Technical Data
 Cam Switch 13
 Contactors 92
 Industrial Control Devices
 22 mm & 30 mm Non-Metallic 151
 22 mm Metallic 135
 30 mm Metallic 143
 B Series 22 mm Metallic 130
 Pendant Stations 159
 Inverter Bypass Safety Switch 3
 Limit Switches 210
 Rope Operated 208
 Manual Motor Starters 107
 NAMUR Sensor Control Unit 263
 Photoelectric Sensors
 18 mm Tubular 273
 EP Series Rectangular 297
 MP Series Rectangular 289
 Power Supplies 327
 Safety Switches
 Hinge Operated 190
 Key Operated 184
 Key Operated Manual Mechanical Delay 188
 Key Operated Solenoid Release 186
 Rope Operated 194, 196
 Slotted Lever Operated 192

Terminal Blocks 329
Accessories
 Barrier Plate 340, 372
 DIN Rail 339, 363, 385
 DIN Rail Mounting Brackets 339, 363
 End Covers 340, 364, 380
 End Stops 339, 363
 End Support 371
 Ferrule Crimping Tools 345
 Ferrules - Insulated 345
 Insulation Displacement Type 359
 Jumpers 341, 369, 380
 Marking Pens 366
 Marking Tag Holders 367
 Marking Tags 342, 365, 379
 Partition Plate 340, 372, 380
 Safety Cover 371
 Terminal Strip Cover 370
 Test Plugs and Sockets 371
 Warning Plate 368
D Series Cage Clamp Style 343
K Series
 2 Level Screw Type 334
 3 Level Screw Type 334
 Accessories 339
 Approvals 330
 Electronic Component Screw Type 335
 Features 330
 Fuse Holder Screw Type 335
 General Information 330
 General Purpose Screw Type 331
 Ground (Earth) 333
 Vibration Resistant Screw Type 334
M Series
 Accessories 339
M Series Mini Screw Type 338
Standard Series
 Approvals 344
 Features 344
 General Information 344
Standard Series - Screw Type
 Disconnect Type 350
 Faston Connector Type 352
 Fuse Holder Type 348
 General Purpose 346
 Ground (Earth) Type 362
 Insulation Displacement Style 359
 Miniature Type 360
 Modular Type 360
 Special Purpose Type 354
 Specialty - Internal Components 361
 Thermocouple Type 358
 Three Level Type 357
 Two Level Type 356
Standard Series - Sping-Clamp Style
 Approvals 373
 Features 373
 General Information 373
U Series
 Accessories 339
 Corrosion Resistant Screw Type 337
Test Plugs 371
Test Sockets 371
Timers 165
 Multi Function/Range/Voltage
 85 Series 177
 Multi Range/Voltage On Delay
 86 Series 178
 Power Off Delay
 88 Series 180
 Sockets 181
 Twin Setting Repeat Cycle
 87 Series 179
Transfer Switch
 Variable Frequency Drive 10
Twin Setting Repeat Cycle
 Timers 179
Two Speed, Three Phase Motor Switch 25

U

Unloader Valve 393

V

Volt Meter Switch 30
Voltage Changeover Switch 31

W

Warning Plates 368

1. Inverter Bypass Safety Switches 1

Components

Open Switch for Direct Control or Contactor Control .. 3

Handle Assembly for Open Switch 4

Assembled Units

Direct Control 4

Direct Control with Motor Overload Protection 5

Starter Control with Motor Overload Protection 6

Contactor Control 8

Options / Dimensions 9

VFD Transfer Switches 10

2. Industrial Cam Switches

General Information

Introduction / Switch General Information 12

Specifications / UL / cUL Ratings / International Approvals 13

Off / On Switches

Open Switch - No Handle Assembly 14

Handle Assembly for Off / On Switch 16

Key Operated Off / On Switch 16

Enclosed Off / On Switch 17

Load Break Off / On Switches

Open Switch with Handle Assembly 18

Load Break Switch Dimensions 19

Motor Reversing Switch

Open Switch - No Handle Assembly 20

Handle Assembly for Motor Reversing Switch 21

Key Operated Motor Reversing Switch 21

Drum Switch 22

Boat Hoist Switch 23

High Pressure Washer Switch

Open Switch with Handle Assembly 24

Two Speed - Three Phase Switch

Open Switch with Handle Assembly 25

Double Throw Switches

Open Switch - No Handle Assembly 26

Handle Assembly for Double Throw Switch 28

Multi-Step Switches 28

Ammeter Switch 29

Volt Meter Switch 30

Voltage Changeover Switch 31

Accessories 32

Dimensions 35

3. Contactors, Starters, Industrial Control Relays & Manual Motor Starters

General Information 38

C Series Contactors

AC coil 39

DC coil 44

Reversing Contactors (AC coil) 46

Reversing Contactors (DC coil) 49

RH Series Thermal Overload Relays 52

Accessories 53

R Series Industrial Control Relays 56

C Series Compact Starters 57

C Series Starters

Starters 60

Reversing Starters 68

Combination Starters - Fused Disconnect 74

Combination Starters - Circuit Breaker 80

Wye Delta Starters 86

Part Winding Starters 87

Factory Installed Modifications 88

Starter Enclosure Dimensions 89

Replacement Parts 90

Technical Data 92

Dimensions 94

MSM Series Manual Motor Starters 106

Contactor Conversion

BF Series to C Series 110

Pump Control Panels

Simplex Pump Panels 111

Duplex Pump Panels 113

4. Load Break Disconnect Switches

General Information and Features 116

Disconnect Switches - Open 117

Ratings 117

Handle Assemblies 118

Disconnect Switches in Enclosures 119

Accessories 120

Class CC Fuses 121

Class CC Fuse Blocks 121

Dimensions 122

5. Fuses and Fuse Blocks

Class CC 124

Midget 125

Class J 127

Fuse Sizing Guide 126

Fuse Blocks 128

6. Industrial Control Devices (Pushbuttons)

22 mm Metallic Devices - B Series NEW!

How to Order / Technical Specifications 130

Non-Illuminated Operators / Contact Blocks 131

Illuminated Operators and Selector Switches 132

Pilot Lights 132

Accessories / Replacement Parts 133

Pushbutton control stations / Enclosures 134

22 mm Metallic Devices

How to Order / Technical Specifications 135

Non-Illuminated Operators / Contact Blocks 136

Selector Switches (Non-Illuminated) 137

Illuminated Operators and Selector Switches 138

Pilot Lights 138

Accessories / Replacement Parts 139

Pushbutton control stations / Enclosures 141

Legend Plates / Dimensions 142

30 mm Metallic Devices

How to Order / Device Characteristics / Technical Specifications 143

Non-Illuminated Pushbuttons / Contact Blocks 144

Illuminated Pushbuttons 145

Selector Switches (Non-Illuminated / Illuminated) 146

Key Selector Switches / Reset Operator 147

Pushbutton Stations 148

Accessories / Replacement Parts 149

Legends / Dimensions 150

22 mm and 30 mm Non-Metallic Devices

How to Order / Technical Specifications 151

30 mm Non-Metallic Devices

Non-Illuminated / Illuminated Pushbuttons 152

Pilot Lights 152

Selector Switches 152

22 mm Non-Metallic Devices

Non-Illuminated Pushbuttons 153

Illuminated Pushbuttons 153

Pilot Lights 154

Selector Switches - Knob Type 154

Selector Switches - Key Type 155

Pushbutton Stations / Enclosures 155

Contact Blocks 156

Accessories 156

Spare Parts 22 mm and 30 mm 156

Legend Plates / Dimensions 157

Miniature Indicator Lights 158

Pendant Stations

How to Order / General Information 159

Component Parts for Pendant Stations 161

Legend Plates / Dimensions 162

Custom Pendant Stations 163

7. Relays, Timers & Sockets

Relays 166

Timers 177

Sockets and Accessories 181

8. Safety Switches

Key Operated Safety Switch 184

with Solenoid Release 186

with Manual Mechanical Delay 188

Hinge Operated Safety Switch 190

Slotted Lever Operated Safety Switch 192

Right Angle Rope Operated Safety Switch 194

Top Entrance Rope Operated Safety Switch 196

Safety Control Relays 198

Enclosed Safety Load Break Disconnect Switches 199

Emergency Stop Stations 200

Safety Switch Accessories 200

9. Industrial Limit Switches

General Information and Features 202

Ordering Information 203

Operator Types

Plunger / Roller Plunger 204

Rod / Whisker / Roller Plunger 205

Offset / Adjustable Roller / Rod Lever 206

Roller Lever 207

Rope Pull Limit Switch 208

Accessories, Spare Parts, Technical Specifications 210

Contact Operation Diagrams 211

10. Proximity Sensors

General Information

Inductive Proximity Sensors 214

NAMUR Sensors 217

Capacitive Sensors 218

Size / Material Correction Factors 219

Sensitivity / Temperature Adjustment 220

Mounting of Sensors 221

Installation Requirements 221

Connection Ground 221

Inductive Proximity Sensors • Tubular 222

Rectangular 247

Capacitive Proximity Sensors • Tubular 254

NAMUR Inductive Sensors • Tubular 261

Control Unit 263

Wiring and Cable Connection Diagrams 264

Specialty Proximity Sensors 268

11. Photoelectric Sensors

General Information and Features 270

18 mm Threaded Tubular 272

MP Series

Diffuse 275

Retro-Reflective 278

Through Beam 280

Convergent 283

Dimensions 288

Technical Specifications 289

Wiring Diagrams 290

EP Series

Retro-Reflective 291

Diffuse 292

Convergent 294

Through Beam 296

Technical Specifications 297

Wiring Diagrams 298

12. Cable Connectors for Proximity & Photoelectric Sensors

M8 (PICO Style) 300

M12 (MICRO Style) DC 307

M12 (MICRO Style) AC 312

1/2 - 20 (MICRO Style) 315

7/8 - 16 (MINI Style) 319

Extension Cable Assemblies 324

13. Enclosed Switching Power Supplies 325

14. Terminal Blocks

K Series Terminal Blocks NEW!

Features and Construction 330

General Purpose Type 331

Ground (Earth) Type 333

2 and 3 Level 334

Vibration Resistant 334

Fuse Holder Type 335, 336

Electronic Component Type 335, 336

Disconnect Type 336

U Series Corrosion Resistant NEW! 337, 338

M Series Miniature Type NEW! 338

K Series, U Series & M Series Accessories NEW! 339

D Series Cage Clamp Terminal Blocks NEW! 343

Standard Style Terminal Blocks 344

Ferrules 345

General Purpose Type 346, 347

Fuse Holder Type 348

Disconnect Type 350

Faston Connector Type 352

Special Purpose Type 354

Two Level Type 356

Three Level Type 357

Thermocouple Type 358

Insulation Displacement Type 359

Miniature Type 360

Modular Two / Three Pole Type 360

Electronic Component Type 361

Ground (Earth) Type 362

Accessories 363

Spring Clamp Terminal Blocks 373

Spring Clamp Accessories 380

15. Non-Metallic Enclosures, DIN Rail, Cable Glands

Enclosures 382

DIN Rail 385

Liquid Tight Cable Glands 386

16. Air Compressor and Pump Switches 389

Index 395



ADVANCE CONTROLS, INC.®



Catalog 105a Start Page



1. Inverter Bypass Safety Switches



2. Industrial Cam Switches



3. Contactors, Starters, Industrial Control Relays, Manual Motor Starters and Pump Control Panels



4. Load Break Disconnect Switches



5. Fuses and Fuse Blocks



6. Industrial Control Devices (Pushbuttons)



7. Relays, Timers & Sockets



8. Safety Switches



9. Limit Switches



10. Proximity Sensors



11. Photoelectric Sensors



12. Cable Connectors for Proximity and Photoelectric Sensors



13. Enclosed Switching Power Supplies



14. Terminal Blocks



15. Non-Metallic Enclosures, DIN Rail & Cable Glands



16. Air Compressor and Pump Switches