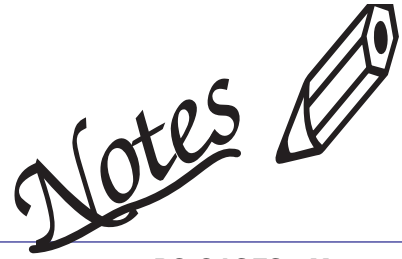




APPLICATION



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Basler Cases and Dimensions vs. Older Electromechanical Relays

It is widely known that Basler makes "Plug and Play" retrofits for the *WH/ABB-CO, GE-IAC, GE-SFC, and GE-ACR relays. These relays fit directly into the case of the existing relay, require no rewiring on the part of the user, and have settings that mimic the settings of the old relay, so the installation is referred to as "plug and play." However, there are literally thousands of other old relays in service that people may want to replace as easily, but the market for any one of them is small, so the development costs cannot be easily justified. Hence, a numeric multifunction relay that fits into the location of the old relay is possibly the next choice. Even if a plug and play retrofit was available for every one of these older relays, sometimes customers want the benefits of numeric relays, such as programmable logic, more I/O, detailed event reports, metering, SCADA communication ports talking Modbus™ or DNP, and so on. This concept even embraces the replacement of existing Basler solid state relays with more modern numeric relays.

To assist this market, Basler Electric has made a special effort to build numeric relays, as well as our older single function solid state relays, in cases that fit into the cutouts of older electromechanical relays. All Basler numeric relays are available in cases that are retrofit friendly. For instance, the BE1-1051, -CDS220, and -CDS240 are available in the vertically oriented MX case to fit into the space used by many GE and WH/ABB electromechanical relays. In the S1 case used by the BE1-851, -951, -GPS, and -IPS relays, Basler has also helped to solve the question of how to install test/isolation switches with numeric relays. Basler includes in the S1 case a set of GE style test paddles, then routes currents and voltages, and one trip output, through

these test paddles. Besides the dollar and man-hour savings achieved when a replacement relay fits neatly into an existing panel, yielding less "slicing and dicing" of the panel steel and possibly even saving the costly replacement of an entire door, the S1 case also reduces the need for drilling the panel to install isolation/test switches for the relay. Since isolation/test devices cost approximately \$400, and the installed cost can be higher than \$1000 due to design and installation overheads, the built-in test paddles in the S1 cases add tremendous value to the S1 case relays.

Can Basler Replace My Old Relay?

To determine if a Basler relay can replace a given older style relay, the first step is to understand the functionality of the old relay and to compare it to the appropriate relays in the Basler line, and to consider any functionality improvements that the user wants in the end product and design. Due to the huge variety of electromechanical and other relays with so many subtle variations in functionality and subtle variations in the application of the relay, Basler cannot provide a list showing which relays we can reproduce exactly with our numeric relays. Therefore, the analysis task usually must be customized. In some cases, one may need to look at using our older solid state relay line, but the preferred approach will usually be to use a numeric relay. As an aid to starting this analysis, a list of the device function numbers for Basler numeric relays is given in Table 1. Contact Basler Technical Support or an Application Engineer to assist in analyzing your application.

BE1- Numeric Systems S = Standard O = Optional	BE1-851	BE1-951	BE-1051	BE1-CDS220	BE1-CDS240	BE1-GPS100	BE1-IPS100
	24		S	S		S	S
25		O	O			O	S
25VM		O	O				S
27P		S	S		S	S	S
27-3N		O	O			S	S
32		S	S			S	S
40Q						S	
46N						S	
47N		S	S		S	S	S
50P/50N	S	S	S	S	S	S	S
51P/51N	S	S	S	S	S	S	S
51/27C		S	S		S	S	S
51/27R		S	S		S	S	S
50Q/51Q	O	S	S	S	S		S
BF	S	S	S	S	S	S	S
59P		S	S		S	S	S
59N		S	S			S	S
60FL		S	S		S	S	S
62	S	S	S	S	S	S	S
67P		S	S				S
67N		S	S				S
67Q		S	S				S
79	S	S	S				S
81		S	S		S	S	S
87				S	S		
87ND				O	S		
Contact I/O Option					O		
Setting Groups	S	S	S	S	S	S	S
Load Encroachment			S				
Comm Protocols	O	O	O	O	O	O	O
Real Time Metering	S	S	S	S	S	S	S
Load Profile		O	O	O	O	O	O
Oscillography	S	S	S	S	S	S	S
Fault Data	S	S	S	S	S	S	S
Test Paddle (S1 case)	O	O				O	O
Poly-Phase	S	S	S	S	S	S	S
50/60Hz	S	S	S	S	S	S	S

Table 1: BE1 Numeric Relay System Features

Once the functionality requirements are compared and an appropriate relay is selected based upon functionality, a second consideration is to determine how to fit the new relay into the panel. As an aid to this process, Table 3 compares some of Basler's targeted applications, and Table 2 gives a more detailed listing of dimensions of the common Basler, GE, and WH/ABB cutouts and cover footprints. Table 4 gives plus or minus comparison of Basler dimensions to other indicated cases. In some applications, Basler Electric has adapter plates available to make the relay fit into the existing panel space. Further, Basler has the capability of making other adapter plates upon a special request.

Mfr.	Case	Panel Cutout		Cover Footprint	
		Width	Height	Width	Height
Basler	A1 (50/51B)	5.690	6.630	6.650	7.570
Basler	C1 (50/51M)	5.690	3.550	6.875	4.000
Basler	F1	5.875	5.875	6.376	7.250
Basler	H1 (w/escutcheon)	8.900	3.800	10.498	4.458
Basler	H1 (half rack)	8.750	3.500	10.500	3.470
Basler	L (CDS240)	5.690	14.630	6.610	20.130
Basler	M1	5.690	14.630	6.650	15.320
Basler	MX (w/escutcheon)	5.690	14.630	6.610	16.200
Basler	MX (19" rack)	14.630	5.250	19.000	5.220
Basler	S1	5.690	8.630	6.650	9.320
GE	C1 (IFC)	5.688	6.188	6.063	7.375
GE	L1, L1E	5.688	20.000	6.625	20.313
GE	L2, L2B, L2D, L2T	5.688	20.000	6.625	20.313
GE	M1, M1E	5.688	14.813	6.625	15.125
GE	M2, M2D	5.688	16.000	6.625	16.313
GE	S1, S1E	5.688	8.813	6.625	9.125
GE	S2	5.688	10.000	6.625	10.313
GE	V1 (SFC)	5.688	6.688	6.625	7.000
WH/ABB	FT-11	5.875	5.875	6.375	7.250
WH/ABB	FT-21/22	5.875	9.063	6.375	10.438
WH/ABB	FT-31/32	5.875	15.125	6.375	16.500
WH/ABB	FT-41/42	5.875	17.875	6.375	19.250
ABB	Circuit Shield	6.625	3.687	6.875	4.875

Table 2: Case Cutout and Cover Footprint (inches)

Table 2 above lists the specified panel cutouts. The actual relay is somewhat smaller than its cutout.

Basler Relay Fitment for Older Relay Electromechanical Relay Cutouts

In Table 3 (next page) each cell answers the question: "Would the Basler relay case size indicated at the top of the column fit into the relay cutout indicated in the left column?" In some applications, the existing cutout is larger than the Basler relay. The customer can build his own adapter plate or can obtain a relatively inexpensive one from Basler, part number as indicated.

	50/51B, 79A Plug & Play	BE1 Non-Numeric Relays in S-Case	BE1 Non-Numeric Relays in M-Case	851 F-case	851/951/GPS/IPS S-case	1051/CDS220/CDS240 M-case	CDS240 L-case
GE V1	Direct fit for SFC	X	X	X	X	X	X
GE S1	Direct fit for IAC	Direct fit	X	X	Direct fit	X	X
GE S2	Direct fit for ACR	Fits with adapter plate 9108551021	X	X	Fits with adapter plate 9108551021	X	X
GE M1		Fits with adapter plate 9108551029	Direct fit	X	Fits with adapter plate 9108551029	Direct fit	Use M case
GE M2		Fits with adapter plate 9108551029	Fits with filler	X	Fits with adapter plate 9108551029	Direct fit	Use M case
WH/ABB FT11	Direct fit for CO	X	X	Direct fit	X	X	X
WH/ABB FT21/22		Fits with adapter plate 9108551021	X	Fits with filler	Fits with adapter plate 9108551021	X	X
WH/ABB FT31/32		Fits with adapter plate 9108551022	Fits with filler	Fits with filler	Fits with adapter plate 9108551022	Direct fit	Use M case
WH/ABB FT41/42		Fits with filler	Fits with filler	Fits with filler	Fits with filler	Fits with filler (CDS240, use L Case)	Direct fit

Legend:

Direct fit Relay is designed to bolt into existing cutout using existing mounting points. No panel modifications needed. If relays are very closely spaced, compare cover footprints, Tables 2 and 4.

Fits with Adapter Plate Optional adapter plate allows relay to bolt into existing cutout using existing mounting points. No panel modifications needed. Order adapter plate separately. If relays are very closely spaced, compare cover footprints, Tables 2 and 4.

Fits with Filler Basler relay cutout smaller than existing cutout. No adapter presently available, but Basler relay could be made to fit if panel is modified slightly (new bolt holes drilled and filler plate fabricated).

X Basler relay cutout larger than existing cutout. Existing cutout must be enlarged to accommodate the new relay.

Table 3: Basler Relay Fitment for Electromechanical Relay Cutouts

Older Relay Cutout	Basler Relay Cutout	Panel Cutout		Cover Footprint		Fit or Fits with Adapter Plate
		Width	Height	Width	Height	
GE S1	Basler S1	0.002	-0.183	0.025	0.195	Direct Fit
GE S2	Basler S1	0.002	-1.370	0.025	-0.993	9108551021
GE M1	Basler M1	0.002	-0.183	0.025	0.195	Direct Fit
GE M1	Basler MX (w/escutcheon)	0.002	-0.183	-0.015	1.075	Direct Fit
GE M1	Basler S1	0.002	-6.183	0.025	-5.805	9108551029
GE M2	Basler M1	0.002	-1.370	0.025	-0.993	Fits with filler
GE M2	Basler MX (w/escutcheon)	0.002	-1.370	-0.015	-0.113	Direct Fit
GE M2	Basler S1	0.002	-7.370	0.025	-6.993	9108551029
WH/ABB FT11	Basler F1	0	0	0.001	0	Direct Fit
WH/ABB FT21/22	Basler S1	-0.185	-0.433	0.275	-1.118	9108551021
WH/ABB FT31/32	Basler M1	-0.185	-0.495	0.275	-1.180	Fits with filler
WH/ABB FT31/32	Basler MX (w/escutcheon)	-0.185	-0.495	0.235	-0.300	Direct Fit
WH/ABB FT31/32	Basler S1	-0.185	-6.495	0.275	-7.180	9108551022
WH/ABB FT41/42	Basler M1	-0.185	-3.245	0.275	-3.930	Fits with filler
WH/ABB FT41/42	Basler MX (w/escutcheon)	-0.185	-3.245	0.235	-3.050	Direct Fit
WH/ABB FT41/42	Basler S1	-0.185	-9.245	0.275	-9.930	Fits with filler
WH/ABB FT41/42	Basler L1	-0.185	-3.245	0.235	0.880	Direct Fit

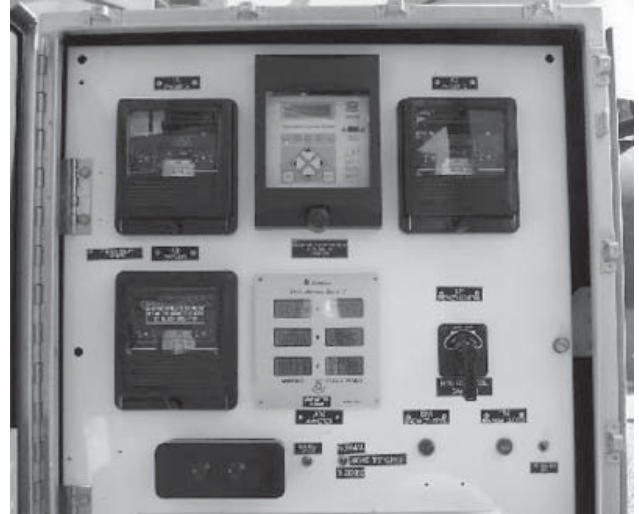
Table 4: Differential Sizes (Basler dimensions minus GE or WH/ABB dimensions) for a select set of comparisons

In Table 4, a negative value indicates the Basler dimensions are smaller, and the existing cutout can accommodate the Basler relay with no cutting. A relay is smaller than its cutout, so a Basler relay will fit more loosely into the indicated cutout than is indicated by simply comparing cutout sizes. Note that in some cases of a "direct fit," a Basler cover footprint is larger, so if relays are closely spaced, verify that there will be no issue in this regard.

Retrofit Examples

Basler has many example applications of our relays applied as retrofit relays. A few are shown on page 4. The two pictures on the top show BE1-951 relays replacing some old electromechanical relays in a tight panel space, courtesy of Nashville Electric. The center photos show a BE1-CDS220 replacing a Basler BE1-87T relay, courtesy of AEL&P, Juneau, Alaska. The bottom two photos show a BE1-851 replacing a GE-CHC, courtesy of Texas Municipal Power Agency, Bryan, Texas.

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BE1-951 replacing GE-IAC (left) and WH/ABB-CO (right), Nashville, Tennessee



BE1-CDS220 replacing BE1-87T, Juneau, Alaska



BE1-851 replacing GE-CHC, Bryan, Texas

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