

Application Note

Basler Cases and Dimensions vs. Older Electromechanical Relays

It is widely known that Basler Electric 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 digital 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 digital relays, such as programmable logic, more I/O, detailed event reports, metering, SCADA communication ports talking Modbus® or DNP3, and so on.

This concept even embraces the replacement of existing Basler solid state relays with more modern digital relays.

To assist this market, Basler Electric has continually made a special effort to build digital relays, as well as our older single function solid state relays, in cases that fit into the cutouts of older electromechanical relays. All Basler digital relays are available in cases that are retrofit friendly.

In addition to the S1 case relays, Basler also offers a K case in the BEI-FLEX digital relay. The K case is a non-drawout S1 size case that fits into an S1 cutout. The relay can be removed without unlanding each separate wire because many of the rear terminal blocks are removable from the case and the boards themselves can be removed from the device.

Besides the financial and labor 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. The K case typically requires installation of isolation /test switches for testing the relay.

Can Basler Replace My Old Relay?

The BEI-FLEX greatly simplifies the way relay retrofits can be approached. Instead of having to go through a comparison chart, simply go to the BEI-FLEX to verify the functionality needed.

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 digital 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 digital relay. As an aid to starting this analysis, a list of the device function numbers in the BEI-FLEX is given in Figure 1 and the protection package required for the function. Contact Basler Technical Support or our Applications personnel to assist in analyzing your application.

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 1 gives a more detailed listing of dimensions of the common Basler, GE, and WH/ABB cutouts and cover footprints. It lists the specified panel cutouts. The actual relay is somewhat smaller than its cutout.
- Table 2 compares some of Basler’s targeted applications.
- Table 3 gives plus or minus comparison of Basler dimensions to other indicated cases.

In some applications, Basler Electric has adapter plates available to fit the relay into the existing panel space. Further, Basler has the capability of making other adapter plates upon a special request.

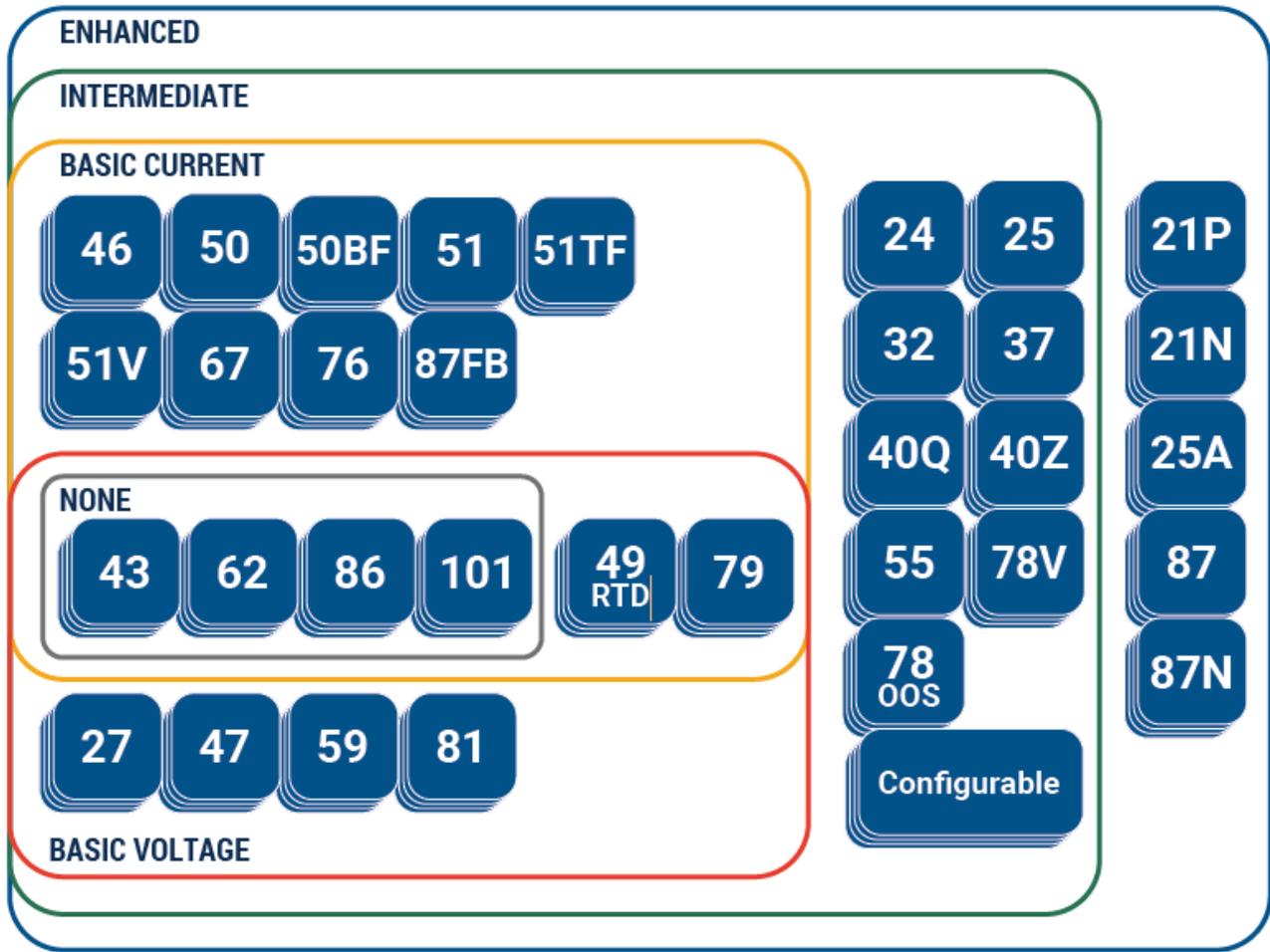


Figure 1 - BE1-FLEX Device Functions

Table 1 - Case Cutout and Cover Footprint (inches)

Mfr.	Case	Panel Cutout		Cover/Front Panel 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
Basler	J	5.690	8.630	7.000	9.120
Basler	K	5.690	8.630	7.210	9.53
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

Basler Relay Fitment for Older Relay Electromechanical Relay Cutouts

In Table 2, each cell answers the question: "Would the Basler relay case size indicated in the top row 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.

In Table 3, 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 pages 4 and 5. Figure 2 shows BEI-951 relays replacing some old electromechanical relays in a tight panel space, courtesy of Nashville Electric. Figure 3 shows a BEI-CDS220 replacing a Basler BEI-87T relay, courtesy of AEL&P, Juneau, Alaska. Figure 4 shows a BEI-851 replacing a GE-CHC, courtesy of Texas Municipal Power Agency, Bryan, Texas.

For more upgrade solutions, see the Upgrade Experts chart at www.basler.com.

For ordering assistance, contact your local Basler sales representative or visit our web site at www.basler.com.

Table 2 - Basler Relay Fitment for Electromechanical Relay Cutouts

	50/51B, 79A Plug & Play	BE1 Non-Digital Relays in S-Case	BE1 Non-Digital Relays in M-Case	851/S-case	1051/CDS240 M-case	CDS240 L-case	BE1-FLEX/BE1-11 J- case
GE V1	Direct fit for SFC	X	X	X	X	X	X
GE S1	Direct fit for IAC	Direct fit	X	Direct fit	X	X	Direct fit
GE S2	Direct fit for ACR	Fits with adapter plate 9108551021	X	Fits with adapter plate 9108551021	X	X	Fits with adapter plate 9108551021
GE M1		Fits with adapter plate 9108551029	Direct fit	Fits with adapter plate 9108551029	Direct fit	Use M case	Fits with adapter plate 9108551029
GE M2		Fits with adapter plate 9108551029	Fits with filler	Fits with adapter plate 9108551029	Direct fit	Use M case	Fits with adapter plate 9108551029
WH/ABB FT11	Direct fit for CO	X	X	X	X	X	X
WH/ABB FT21/22	Direct fit for CO (FT21)	Fits with adapter plate 9108551021	X	Fits with adapter plate 9108551021	X	X	Fits with adapter plate 9108551021
WH/ABB FT31/32		Fits with adapter plate 9108551022	Fits with filler	Fits with adapter plate 9108551022	Direct fit	Use M case	Fits with adapter plate 9108551022
WH/ABB FT41/42		Fits with filler	Fits with filler	Fits with filler	Fits with filler (CDS240, use L Case)	Direct fit	Fits with filler

Legend:

- Direct fit: Relay is designed to bolt into existing cutout using existing mounting points. No panel modification needed. If relays are very closely spaced, compare footprints, Tables 1 and 3.
- Fits with...: Optional adapter plate allows relay to bolt into existing cutout using existing mounting points. No panel modifications.
- Adapter Plate needed: Order adapter plate separately. If relays are very closely spaced, compare cover footprints, Tables 1 and 3.
- 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.



Figure 2 - BE1-951 replacing GE-IAC (left) and WH/ABB-CO (right), Nashville, Tennessee

* All product names, trademarks, and trade names are the property of their respective holders and are used here for reference purposes only.

Table 3 - Differential Sizes (Basler dimensions minus GE or WH/ABB dimensions) for a select set of comparisons

Older Relay Cutout	Basler Relay Cutout	Cover/Front Panel Footprint		Fit or Fits with Adapter Plate
		Width	Height	
GE S1	Basler S1	0.025	0.195	Direct Fit
GE S1	Basler J	0.375	-0.005	Direct Fit
GE S1	Basler K	0.585	0.405	Direct Fit
GE S2	Basler S1	0.025	-0.993	9108551021
GE S2	Basler J	0.375	-0.193	9108551021
GE S2	Basler K	0.585	-0.783	9108551021
GE M1	Basler M1	0.025	0.195	Direct Fit
GE M1	Basler MX (w/escutcheon)	-0.015	1.075	Direct Fit
GE M1	Basler S1	0.025	-5.805	9108551029
GE M1	Basler J	0.375	-6.005	9108551029
GE M1	Basler K	0.585	-5.595	9108551029
GE M2	Basler M1	0.025	-0.993	Fits with filler
GE M2	Basler MX (w/escutcheon)	-0.015	-0.113	Direct Fit
GE M2	Basler S1	0.025	-6.993	9108551029
GE M2	Basler J	0.375	-7.193	9108551029
GE M2	Basler K	0.585	-6.783	9108551029
WH/ABB FT11	Basler F1	0.001	0	Direct Fit
WH/ABB FT21/22	Basler S1	0.275	-1.118	9108551021
WH/ABB FT21/22	Basler J	0.625	-1.318	9108551021
WH/ABB FT21/22	Basler K	0.835	-0.908	9108551021
WH/ABB FT31/32	Basler M1	0.275	-1.180	Fits with filler
WH/ABB FT31/32	Basler MX (w/escutcheon)	0.235	-0.300	Direct Fit
WH/ABB FT31/32	Basler S1	0.275	-7.180	9108551022
WH/ABB FT31/32	Basler J	0.625	-7.380	9108551022
WH/ABB FT31/32	Basler K	0.835	-6.970	9108551022
WH/ABB FT41/42	Basler M1	0.275	-3.930	Fits with filler
WH/ABB FT41/42	Basler MX (w/escutcheon)	0.235	-3.050	Direct Fit
WH/ABB FT41/42	Basler S1	0.275	-9.930	Fits with filler
WH/ABB FT41/42	Basler J	0.625	-10.130	Fits with filler
WH/ABB FT41/42	Basler K	0.835	-9.720	Fits with filler
WH/ABB FT41/42	Basler L1	0.235	0.880	Direct Fit



Figure 3 - BE1-CDS220 replacing BE1-87T, Juneau, Alaska



Figure 4 - BE1-851 replacing GE-CHC, Bryan, Texas

The logo features a stylized blue "B" followed by the text "Basler Electric" in a blue sans-serif font.

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