

## Rack Mounting Angles and Accessories

### PROLINE® Rack Angles Overview



PROLINE® Rack Angles are available in 19-, 23- and 24-in. configurations. All Rack Angles have two mounting surfaces that serve as mounts for both rack equipment and rack accessories. Rack Angles are furnished in pairs and are available with tapped holes that directly accommodate 10-32 screws or square holes for use with cage nuts and M5, M6 or 10-32 screws. Rack Angles comply with ANSI/EIA RS-310-D rack mounting standards.

Rack Angles can be mounted directly to the enclosure frame or on grid system straps at almost any depth location. Rack Angles are plated. All mounting hardware to install Rack Angles is included. (Order cage nuts for square hole Rack Angles separately.)

- The standard rack angle position is 44 mm behind the door opening. Rack Angles can be moved forward if desired. Deeper positions require the use of grid straps. 1200-mm and 1600-mm frames require center uprights to mount Rack Angles in right bay or left bay.
- For joining cabinets with Rack Angles in the full forward position, use Joining Kit PJ2FF.
- Shelves, drawer, guides and pull-out shelves require two sets of Rack Angles or frame accessory brackets installed in the frame.

#### Static Load Notes

It is important to comply with manufacturers' recommendations for rack mounting support.

Follow mounting directions for individual equipment.  
Max. 20 lb. (9.1 kg) per rack unit for equipment under 20-in. (508-mm) deep.

Equipment over 20-in. (508-mm) deep or over 20 lb. (9.1 kg) per rack unit requires rear support.

### 19-in. Rack Angles



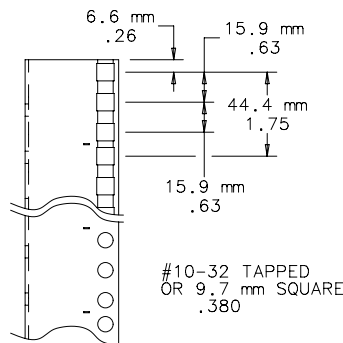
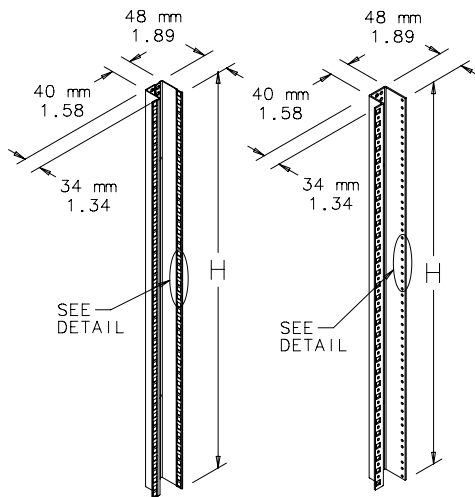
#### ALTO

19-in. U-Shaped Rack Angles are available in square-hole and tapped-hole designs. Tapped Rack Angles are 12 gauge plated steel with 10-32 tapped holes. Square-Hole Rack Angles are 14 gauge plated steel designed to accept metric or English cage nuts. 19-in. Rack Angles are fixed directly into a 600-mm wide enclosure frame. To mount 19-in. Rack Angles in 700- or 800-mm wide frames, use frame reducing brackets.

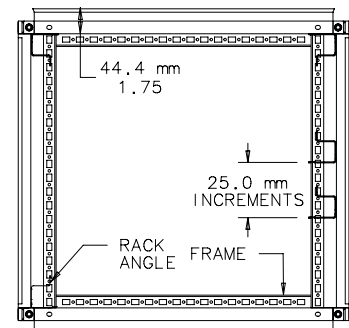
Bulletin: P20

Catalog Number	Hole	H (mm)	H (in.)	Fits Frame	Rack Units
PRA197TH	Square	578	22.77	700 mm	13
PRA197TP	Tapped	578	22.77	700 mm	13
PRA198TH	Square	712	28.02	800 mm	16
PRA198TP	Tapped	712	28.02	800 mm	16
PRA1914TH	Square	1290	50.77	1400 mm	29
PRA1914TP	Tapped	1290	50.77	1400 mm	29
PRA1916TH	Square	1467	57.77	1600 mm	33
PRA1916TP	Tapped	1467	57.77	1600 mm	33
PRA1918TH	Square	1690	66.52	1800 mm	38
PRA1918TP	Tapped	1690	66.52	1800 mm	38
PRA1920TH	Square	1867	73.52	2000 mm	42
PRA1920TP	Tapped	1867	73.52	2000 mm	42
PRA1922TH	Square	2090	82.27	2200 mm	47
PRA1922TP	Tapped	2090	82.27	2200 mm	47

Vertical holes spaced in 1.75-in. (44.5-mm) increments.



DETAIL



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## Rack Mounting Angles and Accessories

### 23-in. Rack Angles



23-in. Rack Angles are available for telecom applications. They fit directly into 700-mm wide frames or into 800-mm wide frames using frame reducing brackets. Rack Angles are 12 gauge steel with 10-32 tapped holes. 23-in. Rack Angles are available with either 1.75-in. rack units or 1.00-in. vertical hole spacing.

Bulletin: P20

Catalog Number	Hole	Height mm/in.	Fits Frame Height	Rack Units
PRA237TP	Tapped	584	700 mm or taller	13
		22.99		
PRA2314TP	Tapped	1270	1400 mm or taller	29
		50.00		
PRA2316TP	Tapped	1473	1600 mm or taller	33
		57.99		
PRA2318TP	Tapped	1676	1800 mm or taller	38
		65.98		
PRA2320TP	Tapped	1879	2000 mm	42
		73.98		

Vertical holes spaced in 1.00 in. (25.4mm) increments.

### 24-in. Rack Angles

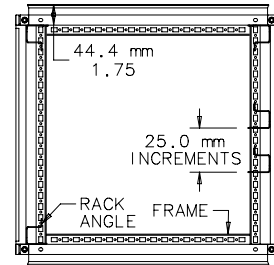
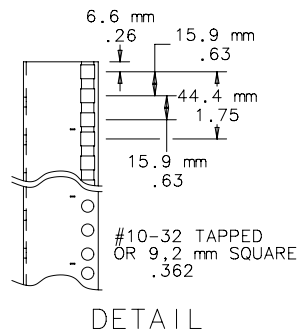
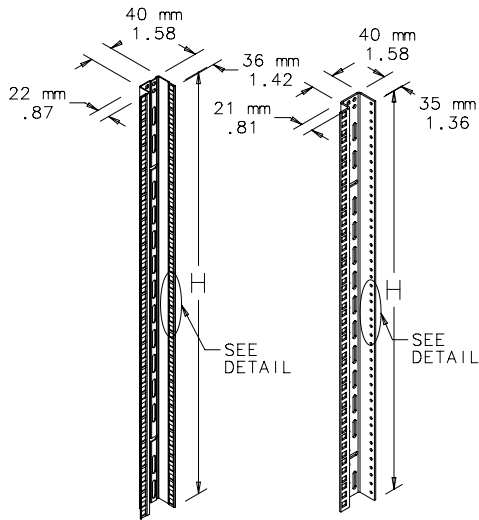


24-in. Rack Angles are available in both square-hole and tapped-hole designs. Tapped Rack Angles are 12 gauge plated steel with 10-32 tapped holes. Square-Hole Rack Angles are 14 gauge plated steel designed to accept metric or English cage nuts. 24-in. Rack Angles fit directly into 700- or 800-mm wide frames using frame reducing brackets.

Bulletin: P20

Catalog Number	Hole	H (mm)	H (in.)	Fits Frame	Rack Units
PRA247TP	Tapped	578	22.77	700 mm	13
PRA2414TH	Square	1245	49.02	1400 mm	29
PRA2416TH	Square	1467	57.77	1600 mm	33
PRA2416TP	Tapped	1467	57.77	1600 mm	33
PRA2418TP	Tapped	1690	66.52	1800 mm	38
PRA2420TH	Square	1867	73.52	2000 mm	42
PRA2420TP	Tapped	1867	73.52	2000 mm	42
PRA2422TH	Square	2090	82.27	2200 mm	47
PRA2422TP	Tapped	2090	82.27	2200 mm	47

Vertical holes spaced in 1.75-in. (44.5-mm) increments.



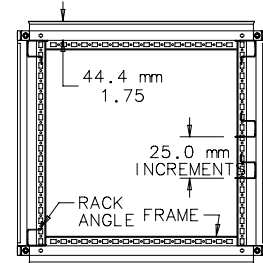
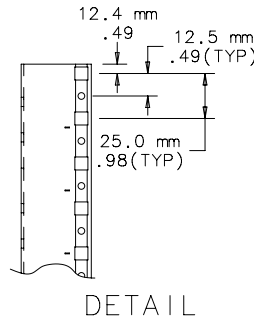
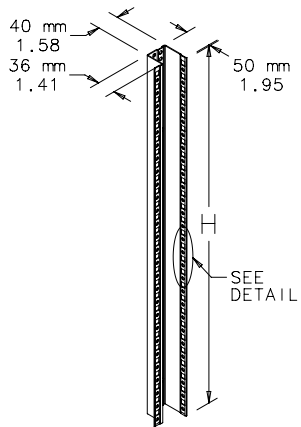
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## Rack Mounting Angles and Accessories

### Metric Rack Angles **A-T-O**

Metric U-Shaped Rack Angles are available with square holes spaced vertically in 25-mm increments to accept metric or English cage nuts. These Rack Angles are built in accordance with standard IEC 917-2-1 to accommodate metric subracks. They are sized to fit directly into 600-mm wide frames. Use frame reducing brackets to mount in 700- or 800-mm wide frames.

Bulletin: P20



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Catalog Number	H (mm)	H (in.)	Fits Frame Height	Rack Units
PRAM14	1275	50.20	1400 mm	29
PRAM16	1475	58.07	1600 mm	33
PRAM18	1675	65.94	1800 mm	38
PRAM20	1875	73.82	2000 mm	42
PRAM22	2075	81.69	2200 mm	47

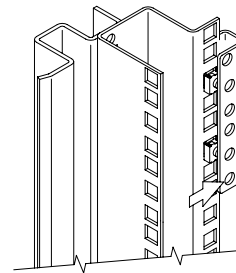
Vertical holes spaced in 25-mm increments.

### Rack Angle Adapter Bracket **A-T-O**

Rack Angle Adapter Brackets mount to PROLINE® Rack Angles. They bring out the rear leg mounting surface to allow traditional Rack Mount Slides (A16SL2U, sold separately) to be used. Fits 19-, 23- and 24-in. tapped or through-hole PROLINE Rack Angles. Rack Angle Adapter Brackets come in a quantity of four and are 14 gauge steel. They have a plated finish.

Bulletin: P20

Catalog Number	Gauge	Use With
PBRAA	14	Rack-Mount Slides A16SL2U



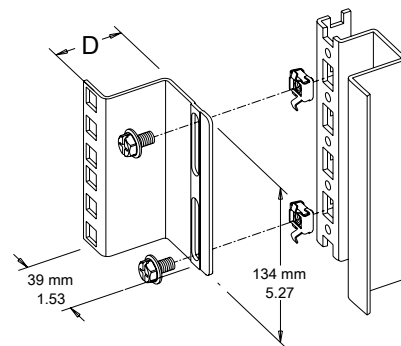
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### Frame Accessory Bracket **A-T-O**



Frame Accessory Brackets mount directly to the PROLINE® frame and are used in place of rack angles to mount rack accessories such as shelves and pull-out shelves. Frame Accessory Brackets are furnished in sets of four and are 14 gauge plated steel. Mounting hardware is included.

Bulletin: P20



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Catalog Number	Description	D (mm)	D (in.)
PFB19	19-in. EIA spacing	36	1.42
PFB23	23-in. EIA spacing	36	1.42
PFB24	24-in. EIA spacing	22	0.87
PFBM	Metric IEC 91721 spacing	36	1.42

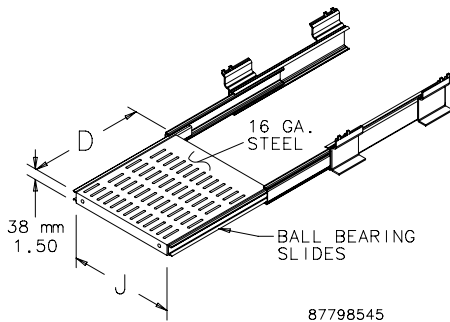
## Rack Mounting Angles and Accessories

### Pull-Out Shelf **A-T-O**

Pull-Out Shelf allows easy access to shelf-mounted devices. Shelf is 16 gauge steel with 12 gauge steel supports. The entire assembly is finished with RAL 7035 textured light-gray polyester powder paint. The shelf mounts to the front surface of front and back rack angles. When mounted directly to a frame, load rating is 150 lb. (68 kg) with four rack angle mountings and 75 lb. (34 kg) with front rack angle mounting.

*Rack accessories that are shorter than the enclosure depth can be mounted to rack angles or frame accessory brackets attached to grid straps. Order these items separately.*

Bulletin: P20

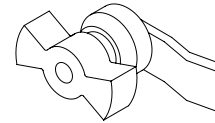


Catalog Number	D		J		Shelf Extension	Fits Rack Width
	mm/in.	mm/in.	mm/in.	mm/in.		
P19PSH5	361	403	350		19 in.	
	14.21	15.87	14.00			
P19PSH6	461	403	450		19 in.	
	18.15	15.87	18.00			
P19PSH8	661	403	670		19 in.	
	26.02	15.87	26.50			
P19PSH9	761	403	770		19 in.	
	29.96	15.87	30.00			
P23PSH5	361	505	350		23 in.	
	14.21	19.88	14.00			
P23PSH6	461	505	450		23 in.	
	18.15	19.88	18.00			
P23PSH8	661	505	670		23 in.	
	26.02	19.88	26.50			
P23PSH9	761	505	770		23 in.	
	29.96	19.88	30.00			
P24PSH6	461	530	450		24 in.	
	18.15	20.87	18.00			
P24PSH8	661	530	670		24 in.	
	26.02	20.87	26.50			
P24PSH9	761	530	770		24 in.	
	29.96	20.87	30.00			

### Pull-Out Shelf Lock **A-T-O**

Pull-Out Shelf Lock is used in combination with the Pull-Out Shelf to hold the shelf in the recessed position. It can be mounted on either the left or right side. This black quarter-turn lock has a wing knob for easy hand operation.

Bulletin: P20



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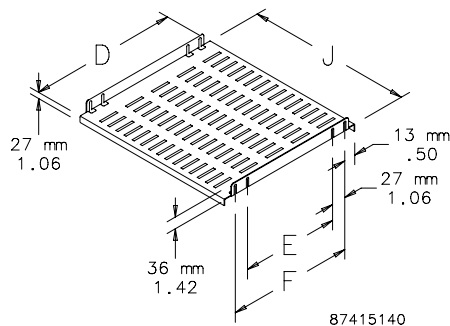
Catalog Number	Description
PSHLOCK	Pull-Out Shelf Lock

### Fixed Shelf **A-T-O**

Fixed Shelves mount to the front and back rack angles. The shelf is 14 gauge steel with adjustable 12 gauge steel supports. Adjustable to fit multiple-depth enclosures or rack angle placements. Entire assembly is finished with RAL 7035 textured light-gray polyester powder paint. Load rating is 150 lb. (68 kg).

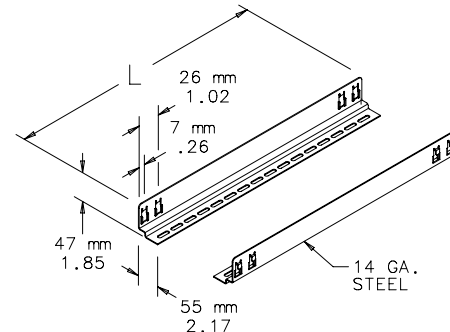
*Rack accessories that are shorter than the enclosure depth can be mounted to rack angles or frame accessory brackets attached to grid straps. Order these items separately.*

Bulletin: P20



Catalog Number	D	E	F	J	Fits Rack Width
	mm/in.	mm/in.	mm/in.	mm/in.	
P19SH5	349	264.8	318.4	477	19 in.
	13.74	10.43	12.54	18.78	
P19SH6	449	364.8	418.4	477	19 in.
	17.68	14.36	16.47	18.78	
P19SH8	649	564.8	618.4	477	19 in.
	25.55	22.24	24.35	18.78	
P19SH9	749	664.8	718.4	477	19 in.
	29.49	26.17	28.28	18.78	
P23SH5	349	270	323.6	578.6	23 in.
	13.74	10.63	12.74	22.78	
P23SH6	449	370	423.6	578.6	23 in.
	17.68	14.57	16.68	22.78	
P23SH8	649	570	623.6	578.6	23 in.
	25.55	22.44	24.55	22.78	
P24SH5	349	264.8	318.4	604	24 in.
	13.74	10.43	12.54	23.78	
P24SH6	449	364.8	418.4	604	24 in.
	17.68	14.36	16.47	23.78	
P24SH8	649	564.8	618.4	604	24 in.
	25.55	22.24	24.35	23.78	
P24SH9	749	664.8	718.4	604	24 in.
	29.49	26.17	28.28	23.78	

**Guides** **A-T-O**



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Equipment Guides help support rack-mounted equipment during installation. Guides mount between two pairs of rack angles. Slotted holes are provided for vertical or lateral adjustment. Furnished in pairs. Guides have plated finish. Mounting hardware included. Can be installed on 19-in. or 24-in. rack angles.

*Rack accessories that are shorter than the enclosure depth can be mounted to rack angles or frame accessory brackets attached to grid straps. Order these items separately.*

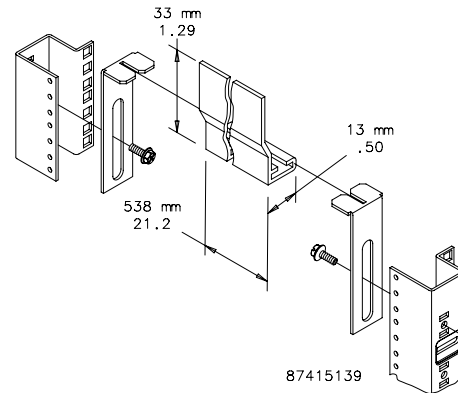
Bulletin: P20

Catalog Number	L (mm)	L (in.)	Frame Depth (mm)	Frame Depth (in.)
PG4	217	8.54	400	15.75
PG5	317	12.48	500	19.68
PG6	417	16.42	600	23.62
PG7	517	20.35	700	27.56
PG8	617	24.29	800	31.49
PG9	717	28.23	900	35.43

**Filler Panel for Rack Angles** **A-T-O**

Filler Panels are used to completely fill 19-in. rack mounting spaces at top and bottom of PROLINE® door opening. Extruded aluminum Filler Panels are furnished in pairs and include mounting hardware.

Bulletin: P20



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Catalog Number	Description
PFP19RA	Filler Panel for Rack Angles

**Screw Package**

Twenty plated screws are included in each package. Screws attach rack panels to rack mounting angles. Available in 10-32, 12-24, M5 and M6.

Bulletin: A80, DACCY, X20

Catalog Number	Description	Pkg. Qty.
AS1032	10-32 x .75	20
ES1224	12-24 x .5	20
ASM5	Metric M5 x 20	20
ASM6	Metric M6 x 16	20
ASM6250	Metric M6 x 16	250

**Cage Nut Package**

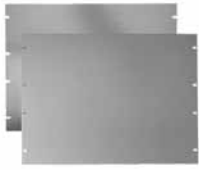
Twenty plated cage nuts are included in each package. Available in 10-32, 12-24, M5 and M6, these cage nuts fit all PROLINE® rack angles with square holes.

Bulletin: DACCY, P20

Catalog Number	Description	Pkg. Qty.
P1032CN	10-32 thread	20
P1224CN	12-24 thread	20
PM5CN	Metric M5 thread	20
PM6CN	Metric M6 thread	20

**Rack Mounting Angles and Accessories**

**Rack Panels**



Rack Panels are available in aluminum and painted steel. Aluminum Rack Panels are .125-in.-thick 5052-H32 alloy. Steel Rack Panels are 12 gauge steel and finished in RAL 7035 textured light-gray polyester powder paint. All panels are flat with oblong holes positioned at EIA standard spacing. Mounting hardware is sold separately.

Bulletin: P20

Catalog Number	Material	Rack Angle Size	Rack Units
P19RP1UA	Aluminum	19 in.	1
P19RP1UP	Steel	19 in.	1
P19RP2UA	Aluminum	19 in.	2
P19RP2UP	Steel	19 in.	2
P19RP3UA	Aluminum	19 in.	3
P19RP3UP	Steel	19 in.	3
P19RP4UA	Aluminum	19 in.	4
P19RP4UP	Steel	19 in.	4
P19RP5UA	Aluminum	19 in.	5
P19RP5UP	Steel	19 in.	5
P19RP6UP	Steel	19 in.	6
P19RP6UA	Aluminum	19 in.	6
P19RP7UA	Aluminum	19 in.	7
P19RP7UP	Steel	19 in.	7
P19RP8UP	Steel	19 in.	8
P19RP8UA	Aluminum	19 in.	8
P19RP9UA	Aluminum	19 in.	9
P19RP9UP	Steel	19 in.	9
P19RP10UA	Aluminum	19 in.	10
P19RP10UP	Steel	19 in.	10
P19RP11UA	Aluminum	19 in.	11
P19RP11UP	Steel	19 in.	11
P19RP12UA	Aluminum	19 in.	12
P19RP12UP	Steel	19 in.	12
P19RP16UA	Aluminum	19 in.	16
P19RP16UP	Steel	19 in.	16
P23RP1UA	Aluminum	23 in.	1
P23RP1UP	Steel	23 in.	1
P23RP2UP	Steel	23 in.	2
P23RP3UA	Aluminum	23 in.	3
P23RP3UP	Steel	23 in.	3
P23RP4UA	Aluminum	23 in.	4
P23RP4UP	Steel	23 in.	4
P24RP2UA	Aluminum	24 in.	2
P24RP2UP	Steel	24 in.	2
P24RP3UP	Steel	24 in.	3
P24RP4UA	Aluminum	24 in.	4
P24RP4UP	Steel	24 in.	4
P24RP5UA	Aluminum	24 in.	5
P24RP5UP	Steel	24 in.	5
P24RP6UP	Steel	24 in.	6
P24RP8UA	Aluminum	24 in.	8
P24RP8UP	Steel	24 in.	8

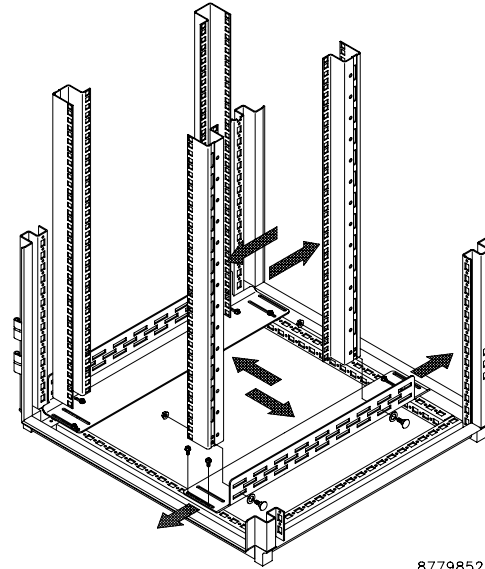
### Adjustable Rack-Mounting Rails



Mounting rails allow rack angles to be positioned anywhere within the PROLINE® frame. The left-to-right adjustment pertains only when the enclosure is wider than the minimum width required for rack angles. Includes two right-hand and two left-hand 12 gauge plated or painted steel mounting rails. Mounting hardware is included.

Bulletin: DPY, P20

Catalog Number	L (mm)	L (in.)	Fits Frame Depth	Finish
PBARA6	511	20.11	600	Plated
PBARA8	711	27.98	800	Plated
PBARA9	811	31.92	900	Plated
PBARA9B	811	31.92	900	Painted RAL 9005 Black
PBARA10B	911	35.86	1000	Painted RAL 9005 Black
PBARA11B	1011	39.79	1100	Painted RAL 9005 Black
PBARA12B	1111	43.73	1200	Painted RAL 9005 Black



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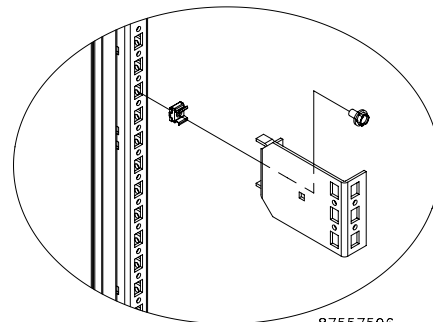
### Frame-Reducing Brackets for Frames or Grid Straps



Frame-Reducing Brackets mount directly to 700- or 800-mm wide PROLINE® frames or to grid straps. Converts wider frames to 600-mm wide, allowing 19-in. rack angles to fit, or to 700-mm wide, allowing 23-in. rack angles to fit. Can be used to left- or right-justify the rack-mounted equipment. Furnished in sets of four. 14 gauge plated steel. Mounting hardware is included.

Bulletin: P20

Catalog Number	Reduces Frame Width	W (mm)	W (in.)	Converts Frame Width
PRB50	50	50	1.97	From 700 to 600 From 800 to 700 mm
PRB100	100	100	3.94	From 800 to 600 From 800 to 700 From 700 to 600 mm
PRB200	200	200	7.87	From 1000 to 600 From 1000 to 800 From 800 to 600 mm



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**Rack Mounting Angles and Accessories**

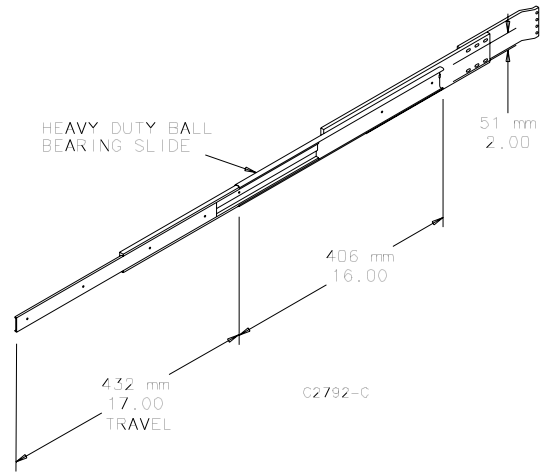
**Slides A-T-O**



Heavy-duty ball bearing, plated three-section Slides are 16-in. (406-mm) long and allow 17-in. (423-mm) extension. They are attached to supports that mount between two pairs of rack-mounting angles that have accessory mounting legs. Mounting hardware is furnished. Equipment 16.75-in. (425-mm) wide can be mounted between Slide assemblies installed on 19-in. rack angles. A pair of Slides can support up to 160 lb. at the extended position when load is distributed evenly along the 16-in. (406-mm) Slide length. Requires Rack Angle Adapter Bracket to fit PROLINE.

*Needs to be used with the Rack Angle Adapter Bracket (PBRAA, PBRAA19 or PBRAA24).*

Bulletin: P20



Catalog Number	Quantity
A16SL2U	2

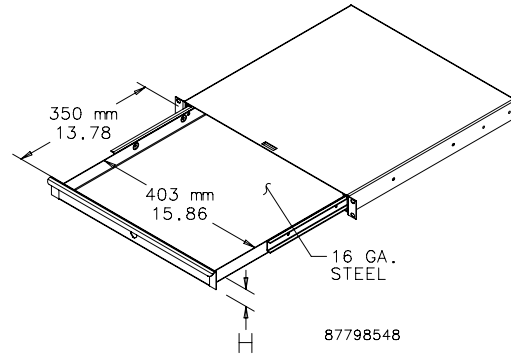
**Rack-Angle Mounted Drawer**



Steel drawer for 19-in. rack-angle mounting mounts to the front surface of the rack angles. Integral steel box contains the drawer and protects surrounding internal equipment. Extends 13 in. (330 mm) on ball bearing slides. Front includes handle and key lock. Finish is RAL 7035 textured light-gray polyester powder paint. Mounting hardware is included.

Bulletin: P20

Catalog Number	H (mm)	H (in.)	Fits Rack Width	Rack Units
P19DR1US	43	1.69	19 in.	1
P19DR2US	88	3.47	19 in.	2
P19DR3US	132	5.20	19 in.	3

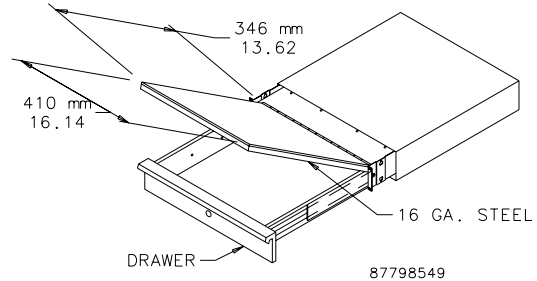


**Writing Surface A-T-O**



A 16 gauge steel cover mounts on top of the drawer to serve as a writing surface and drawer cover. Finish is RAL 7035 textured light-gray polyester powder paint.

Bulletin: P20



Catalog Number	Fits
P19WS	Drawer