



Niehues

Hydraulik · Automation

MINI • BON

Kompakter Kugelhahn



Archivierung: 03/2022



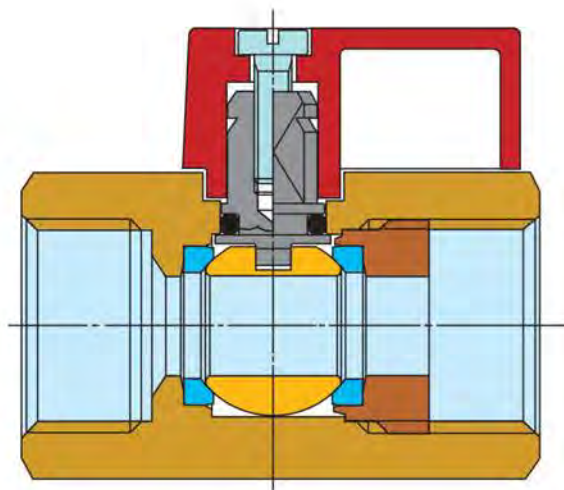
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Hydraulik · Automation



MINI • BON

Kompakter Kugelhahn



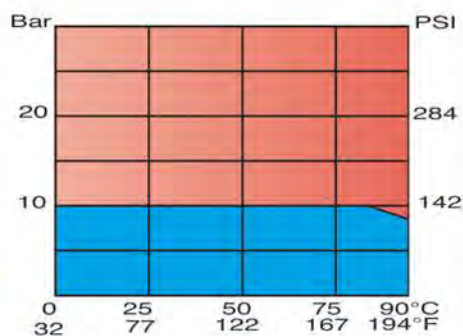
GEHÄUSE	1	
ANSCHLUßSTÜCK	2	
KUGEL	3	
KUGELDICHTUNGEN	4	
SPINDEL	5	
O-RING	6	
GRIFF	7	
SCHRAUBE	8	

Ausblässichere Spindel

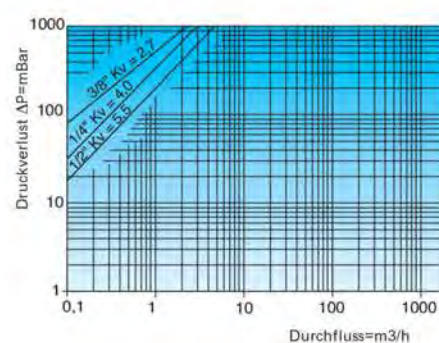


MINI • BON und **MINI • BON • CR** Kugelhähne haben eine von unten montierte Bedienungsspindel. Diese "ausblässichere" Spindel verhindert auch eine Beschädigung des Kugelhahninneren nach dem Einbau. Die Dichtigkeit wird durch einen Gummi-O-Ring erreicht.

Druck/Temperatur-Diagramm



Druckverlust-Diagramm





MINI•BON

EIGENSCHAFTEN

Kompaktes Seriendesign, reduzierter Durchgang.
Schnelles Öffnen und Schliessen durch 90°-Drehung.
Direkte Sichtkontrolle der "Auf/Zu"-Position.
Konkurrenzfähiger Preis.

GEWINDE

ISO 228/1 Standard.

ANWENDUNGEN

MINI•BON-Kugelhähne sind geeignet für die Verwendung mit heissem und kaltem Wasser, Druckluft, Ölen, nichtkorrosiven Flüssigkeiten und Kohlenwasserstoffen allgemein.

Da **MINI•BON**-Kugelhähne nur einen O-Ring haben, wird eine Verwendung mit Gas nicht empfohlen.

Für besondere Anwendungen siehe die Beständigkeitstabelle letzte Seite des Katalogs.

BETRIEBSDRUCK

PN 10 max.

Siehe Druck/Temperatur-Diagramm

TEMPERATUR-GRENZWERTE

-10°C +90°C

MINI•BON•CR BRASS *

EIGENSCHAFTEN

Alle Messingteile von **MINI•BON•CR**-Kugelhähnen werden unter Verwendung der korrosionsresistenten (oder DZR - Entzinkungsresistenten) Messing CW602N hergestellt.

GEWINDE

ISO 228/1 Standard.

ANWENDUNGEN

MINI•BON•CR-Kugelhähne sind besonders geeignet für Installationen mit Chlorwasser oder anderen gefährlichen Medien, die die Entzinkung von Standardmessing hervorrufen.

MINI•BON•CR-Kugelhähne sind auch geeignet für die Verwendung mit heissem und kaltem Wasser, Druckluft, Ölen, nichtkorrosiven Flüssigkeiten und Kohlenwasserstoffen allgemein.

Da **MINI•BON•CR**-Kugelhähne nur einen O-Ring haben, wird eine Verwendung mit Gas nicht empfohlen.

Für besondere Anwendungen siehe die Tabelle der chemischen Beständigkeit.

BETRIEBSDRUCK

PN 10 max.

Siehe Druck/Temperatur-Diagramm

TEMPERATUR-GRENZWERTE

-10°C +90°C

M A T E R I A L A N G A B E N

EINZELTEILE	MATERIALIEN	BESCHREIBUNG
1 Gehäuse	CW 617 N UNI EN 12165 *	Messing MS58, verchromt
2 Anschlußstück	CW 614 N UNI EN 12164 *	Messing
3 Kugel	CW 614 N UNI EN 12164 *	Messing MS58, hartverchromt
4 Kugeldichtungen	P.T.F.E.	Rein P.T.F.E.
5 Spindel	CW 614 N UNI EN 12164 *	Messing MS58, vernickelt
6 O-Ring	NBR	Dichtung
7 Griff	Glasverstärktes Nylon	Schwarz
8 Schraube	8G-Stahl	Verzinkter Stahl

(*) Die **MINI•BON•CR**-Kugelhähnen werden unter Verwendung der Entzinkungsresistenten Messing CW602N hergestellt.

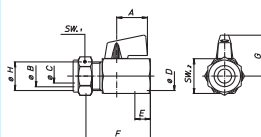
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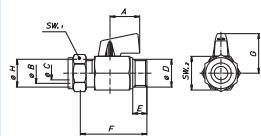
MINI • BON

Kompakter Kugelhahn

Art. S.0306 MINI • BON

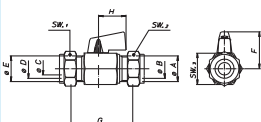
Kugelhahn, Pressringverschraubung/AG/IG, einteiliges 6-Kant-Gehäuse aus MS-verchromt, Plastik-Hebelgriff.

NENNWEITE	¾"x10	¾"x12	½"x12	½"x15					
A mm	22	22	22	22					
øB mm	10	12	12	15					
øC mm	8	8	10	10					
øD	G¾"	G¾"	G½"	G½"					
E mm	9	9	10,5	10,5					
F mm	40	40	45	45					
G mm	27	27	29	29					
øH	G¾"	G¾"	G¾"	G½"					
SW1 mm	19	19	19	24					
SW2 mm	21	21	25	25					

Art. S.0307 MINI • BON

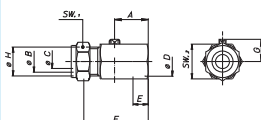
Kugelhahn, Pressringverschraubung/AG/AG, einteiliges 6-Kant-Gehäuse aus MS-verchromt, Plastik-Hebelgriff.

NENNWEITE	¾"x10	¾"x12	½"x12	½"x15					
A mm	22	22	22	22					
øB mm	10	12	12	15					
øC mm	8	8	10	10					
øD	G¾"	G¾"	G½"	G½"					
E mm	9	9	10,5	10,5					
F mm	41	41	50	50					
G mm	27	27	29	29					
øH	G¾"	G¾"	G¾"	G½"					
SW1 mm	19	19	19	24					
SW2 mm	21	21	25	25					

Art. S.0308 MINI • BON

Kugelhahn, Pressringverschraubung (beidseitig), einteiliges 6-Kant-Gehäuse aus MS-verchromt, Plastik-Hebelgriff.

NENNWEITE	10x¾"x10	12x¾"x12	12x½"x12	15x½"x15					
øA	G¾"	G¾"	G¾"	G½"					
øB mm	10	12	12	15					
øC mm	8	8	10	10					
øD mm	10	12	12	15					
øE	G¾"	G¾"	G¾"	G½"					
F mm	27	27	29	29					
G mm	41	41	41	50					
øH mm	22	22	22	22					
SW1 mm	19	19	19	24					
SW2 mm	19	19	19	24					
SW3 mm	21	21	25	25					

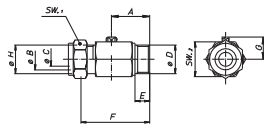
Art. S.0309 MINI • BON

Kugelhahn, Pressringverschraubung/AG/IG, einteiliges 6-Kant-Gehäuse aus MS-verchromt, Schraubendreher.

NENNWEITE	¾"x10	¾"x12	½"x12	½"x15					
A mm	21	21	25	25					
øB mm	10	12	12	15					
øC mm	8	8	10	10					
øD	G¾"	G¾"	G½"	G½"					
E mm	9	9	10,5	10,5					
F mm	40	40	45	45					
G mm	27	27	29	29					
øH	G¾"	G¾"	G¾"	G½"					
SW1 mm	19	19	19	24					
SW2 mm	21	21	25	25					



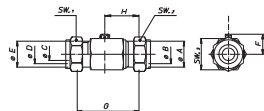
Art. S.0310 MINI • BON



Kugelhahn, Pressringverschraubung/AG, einteiliges 6-Kant-Gehäuse aus MS-verchromt, Schraubendreher.

NENNWEITE	3/8"x10	3/8"x12	1/2"x12	1/2"x15										
A mm	33	33	38,5	38,5										
øB mm	10	12	12	15										
øC mm	8	8	10	10										
øD	G 3/8"	G 3/8"	G 1/2"	G 1/2"										
E mm	9	9	10,5	10,5										
F mm	41	41	50	50										
G mm	27	27	29	29										
øH	G 3/8"	G 3/8"	G 3/8"	G 1/2"										
SW1 mm	19	19	19	24										
SW2 mm	21	21	25	25										

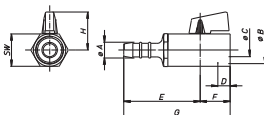
Art. S.0311 MINI • BON



Kugelhahn, Pressringverschraubung (beidseitig), einteiliges 6-Kant-Gehäuse aus MS-verchromt, Schraubendreher.

NENNWEITE	10x3/8"x10	12x3/8"x12	12x1/2"x12	15x1/2"x15										
øA	G 3/8"	G 3/8"	G 3/8"	G 1/2"										
øB mm	10	12	12	15										
øC mm	8	8	10	10										
øD mm	10	12	12	15										
øE	G 3/8"	G 3/8"	G 3/8"	G 1/2"										
F mm	27	27	29	29										
G mm	41	41	41	50										
øH mm	33	33	38,5	38,5										
øI mm	11,7	13,7	13,7	16,8										
SW1 mm	19	19	19	24										
SW2 mm	19	19	19	24										
SW3 mm	21	21	25	25										

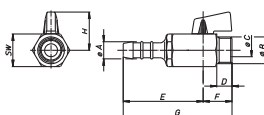
Art. S.0312 MINI • BON



Kugelhahn, IG/Schlauchanschluss, einteiliges 6-Kant-Gehäuse aus MS-verchromt, Plastik-Hebelgriff.

NENNWEITE	1/4"	3/8"	1/2"											
øA	10,5	14	14											
øB	1/4"	3/8"	1/2"											
øC mm	5,5	8	10											
D mm	8	8,5	10											
E mm	48,5	50	55,5											
F mm	18,25	20,25	24											
G mm	66,75	70,25	79,5											
H mm	22	23,5	30											
SW mm	19	21	25											

Art. S.0313 MINI • BON



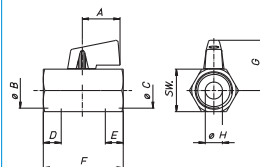
Kugelhahn, AG/Schlauchanschluss, einteiliges 6-Kant-Gehäuse aus MS-verchromt, Plastik-Hebelgriff.

NENNWEITE	1/4"	3/8"	1/2"											
øA	10,5	14	14											
øB	1/4"	3/8"	1/2"											
øC mm	5,5	8	10											
D mm	8,8	8,8	9,8											
E mm	48,5	50	55,5											
F mm	17	19,5	23											
G mm	65,5	69,5	78,5											
H mm	22	23,5	30											
SW mm	19	21	25											



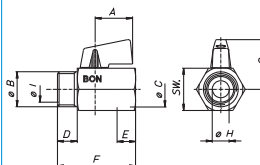
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**MINI • BON****Kompakter Kugelhahn****Art. S.0330 MINI • BON**

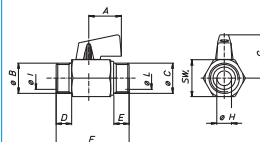
Kugelhahn, IG/IG, einteiliges 6-Kant-Gehäuse, Plastik-Hebelgriff schwarz, MS-verchromt.

NENNWEITE	1/8"	1/4"	3/8"	1/2"	3/4"	1"							
A mm	22	22	22	22	22	22							
øB	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"	G.1"							
øC	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"	G.1"							
D mm	9	9	10	10,5	13,5	15							
E mm	9	9	9	10,5	13,5	15							
F mm	39	39	42	47	54	66							
G mm	27	27	27	29	31,5	35							
øH mm	6	8	8	10	12	17,5							
SW mm	21	21	21	25	30	37							

Art. S.0331 MINI • BON

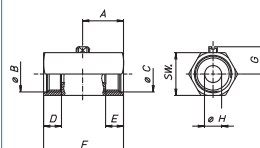
Kugelhahn, AG/IG, einteiliges 6-Kant-Gehäuse, Plastik-Hebelgriff schwarz, MS-verchromt.

NENNWEITE	1/8"	1/4"	3/8"	1/2"x15	3/4"	1"	1/2"x12						
A mm	22	22	22	22	22	22	22						
øB	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"	G.1"	G.1/2"						
øC	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"	G.1"	G.1/2"						
D mm	9	9	9	10,5	13,5	15	10,5						
E mm	9	9	9	10,5	13,5	15	10,5						
F mm	39	39	40	45	51	62,5	45						
G mm	27	27	27	29	31,5	35	29						
øH mm	6	7,5	8	10	12	17,5	10						
øI mm	6	7,5	10,5	15	18	25	12						
SW mm	21	21	21	25	30	37	25						

Art. S.0332 MINI • BON

Kugelhahn, AG/AG, einteiliges 6-Kant-Gehäuse, Plastik-Hebelgriff schwarz, MS-verchromt.

NENNWEITE	1/8"	1/4"	3/8"	1/2"	3/4"								
A mm	22	22	22	22	22								
øB	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"								
øC	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"								
D mm	9	9	9	10,5	13,5								
E mm	9	9	9	10,5	13,5								
F mm	41	41	41	50	55								
G mm	27	27	27	29	31,5								
øH mm	6	8	8	10	12								
øI mm	6	8	12	15	18								
øL mm	6	8	12	15	18								
SW mm	21	21	21	25	30								

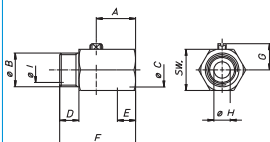
Art. S.0333 MINI • BON

Kugelhahn, IG/IG, einteiliges 6-Kant-Gehäuse, mit Schraubendreher, MS-verchromt.

NENNWEITE	1/8"	1/4"	3/8"	1/2"	3/4"								
A mm	18	18	21	24	27								
øB	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"								
øC	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"								
D mm	9	9	10	10,5	13,5								
E mm	9	9	9	10,5	13,5								
F mm	39	39	42	47	54								
G mm	12,5	12,5	12,5	14,5	17								
øH mm	6	8	8	10	12								
SW mm	21	21	21	25	30								

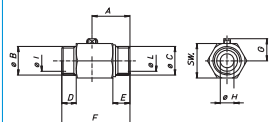
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**Art. S.0334 MINI • BON**

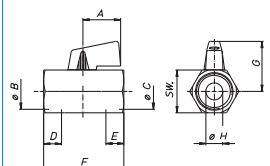
Kugelhahn, AG/IG, einteiliges 6-Kant-Gehäuse, Schraubendreher, MS-verchromt.

NENNWEITE	1/8"	1/4"	3/8"	1/2"	3/4"	1"				
A mm	18	18	21	24	27	22				
øB	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"	G.1"				
øC	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"	G.1"				
D mm	9	9	9	10,5	13,5	15				
E mm	9	9	9	10,5	13,5	15				
F mm	39	39	40	45	51	62,5				
G mm	12,5	12,5	12,5	14,5	17	21				
øH mm	6	8	8	10	12	17,5				
øI mm	6	8	12	15	18	25				
SW mm	21	21	21	25	30	37				

Art. S.0335 MINI • BON

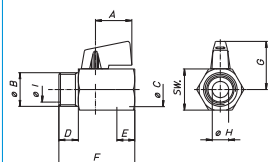
Kugelhahn, AG/AG, einteiliges 6-Kant-Gehäuse, Schraubendreher, MS-verchromt.

NENNWEITE	1/8"	1/4"	3/8"	1/2"	3/4"					
A mm	18	18	21	24	27					
øB	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"					
øC	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"					
D mm	9	9	9	10,5	13,5					
E mm	9	9	9	10,5	13,5					
F mm	41	41	41	50	55					
G mm	12,5	12,5	12,5	14,5	17					
øH mm	6	8	8	10	12					
øI mm	6	8	12	15	18					
øL mm	6	8	12	15	18					
SW mm	21	21	21	25	30					

**Art. S.1317
MINI • BON • LUX**

Kugelhahn, IG/IG, einteiliges 6-Kant-Gehäuse aus MS-verchromt, Hebelgriff verchromt.

NENNWEITE	1/8"	1/4"	3/8"	1/2"	3/4"	1"				
A mm	22	22	22	22	22	22				
øB	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"	G.1"				
øC	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"	G.1"				
D mm	9	9	10	10,5	13,5	15				
E mm	9	9	9	10,5	13,5	15				
F mm	39	39	42	47	54	66				
G mm	27	27	27	29	31,5	36				
øH mm	6	8	8	10	12	17,5				
SW mm	21	21	21	25	30	37				

**Art. S.1318
MINI • BON • LUX**

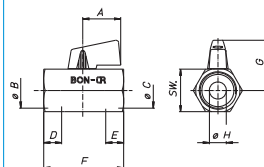
Kugelhahn, AG/IG, einteiliges 6-Kant-Gehäuse aus MS-verchromt, Hebelgriff verchromt.

NENNWEITE	1/8"	1/4"	3/8"	1/2"	3/4"	1"				
A mm	22	22	22	22	22	22				
øB	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"	G.1"				
øC	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"	G.1"				
D mm	9	9	9	10,5	13,5	15				
E mm	9	9	9	10,5	13,5	15				
F mm	39	39	40	45	51	62,5				
G mm	27	27	27	29	31,5	36				
øH mm	6	8	8	10	12	17,5				
øI mm	6	8	12	15	18	25				
SW mm	21	21	21	25	30	37				



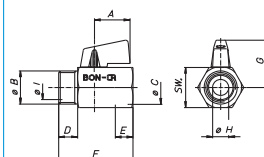
**Niehues**

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**MINI • BON****Kompakter Kugelhahn****Art. S.0338****MINI • BON • CR**

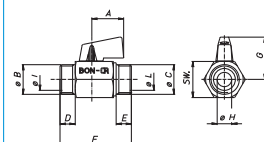
Kugelhahn, IG/G, einteiliges 6-Kant-Gehäuse aus entzinkungsfreiem Messing, Plastik-Hebelgriff, MS-verchromt.

NENNWEITE	1/8"	1/4"	3/8"	1/2"	3/4"					
A mm	22	22	22	22	22					
øB	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"					
øC	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"					
D mm	9	9	10	10,5	13,5					
E mm	9	9	9	10,5	13,5					
F mm	39	39	42	47	54					
G mm	27	27	27	29	31,5					
øH mm	6	8	8	10	12					
SW mm	21	21	21	25	30					

Art. S.0339**MINI • BON • CR**

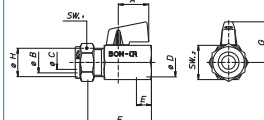
Kugelhahn, IG/AG, einteiliges 6-Kant-Gehäuse aus entzinkungsfreiem Messing, Plastik-Hebelgriff, MS-verchromt.

NENNWEITE	1/8"	1/4"	3/8"	1/2"	3/4"	1"				
A mm	22	22	22	22	22	22				
øB	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"	G.1"				
øC	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"	G.1"				
D mm	9	9	9	10,5	13,5	15				
E mm	9	9	9	10,5	13,5	15				
F mm	39	39	40	45	51	62,5				
G mm	27	27	27	29	31,5	35				
øH mm	6	8	8	10	12	17,5				
øI mm	6	8	12	15	18	25				
SW mm	21	21	21	25	30	37				

Art. S.0340**MINI • BON • CR**

Kugelhahn, AG/AG, einteiliges 6-Kant-Gehäuse aus entzinkungsfreiem Messing, Plastik-Hebelgriff, MS-verchromt.

NENNWEITE	1/8"	1/4"	3/8"	1/2"	3/4"					
A mm	22	22	22	22	22					
øB	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"					
øC	G.1/8"	G.1/4"	G.3/8"	G.1/2"	G.3/4"					
D mm	9	9	9	10,5	13,5					
E mm	9	9	9	10,5	13,5					
F mm	41	41	41	50	55					
G mm	27	27	27	29	31,5					
øH mm	6	8	8	10	12					
øI mm	6	8	12	15	18					
øL mm	6	8	12	15	18					
SW mm	21	21	21	25	30					

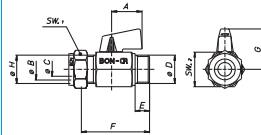
Art. S.0344**MINI • BON • CR**

Kugelhahn, Pressringverschraubung / AG/G, einteiliges 6-Kant-Gehäuse aus entzinkungsfreiem Messing, Plastik-Hebelgriff, MS-verchromt.

NENNWEITE	1/4"x8	3/8"x10	1/2"x12	1/2"x12	1/2"x15	3/4"x18	3/4"x22	1"x28		
A mm	22	22	22	22	22	22	22	22		
øB mm	8	10	12	12	15	18	22	28		
øC mm	8	8	8	10	10	12	12	17,5		
øD	G.1/4"	G.3/8"	G.1/2"	G.1/2"	G.1/2"	G.3/4"	G.3/4"	G.1"		
E mm	9	9	9	10,5	10,5	13,5	13,5	15		
F mm	39	40	40	45	45	51	51	-		
G mm	27	27	27	29	29	31,5	31,5	35		
øH	G.1/4"	G.3/8"	G.1/2"	G.1/2"	G.1/2"	G.3/4"	M28x1,5	M34x1,5		
SW1 mm	17	19	19	19	24	30	32	38		
SW2 mm	21	21	21	25	25	30	30	37		

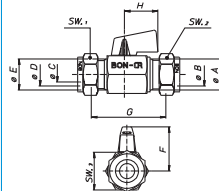
**Niehues**

Hydraulik · Automation

**Art. S.0345**
MINI • BON • CR

Kugelhahn, mit Pressringverschraubung / AG/AG, einteiliges 6-Kant-Gehäuse aus entzinkungsfreiem Messing, Plastik-Hebelgriff, MS-verchromt.

NENNWEITE	1/4"x8	3/8"x10	1/2"x12	3/4"x12	1"x15	1 1/2"x18	2"x22	1"x28		
A mm	22	22	22	22	22	22	22	22		
øB mm	8	10	12	12	15	18	22	28		
øC mm	8	8	8	10	10	12	12	17,5		
øD	G 1/4"	G 3/8"	G 1/2"	G 3/4"	G 1"	G 1 1/2"	G 2"	G 2 1/2"		
E mm	9	9	9	10,5	10,5	13,5	13,5	15		
F mm	41	41	41	50	50	55	55	-		
G mm	27	27	27	29	29	31,5	31,5	35		
øH	G 1/4"	G 3/8"	G 1/2"	G 3/4"	G 1"	M28x1,5	M34x1,5			
SW1 mm	17	19	19	19	24	30	32	38		
SW2 mm	21	21	21	25	25	30	30	37		

Art. S.0346
MINI • BON • CR

Kugelhahn, mit Pressringverschraubung (beidseitig), einteiliges 6-Kant-Gehäuse aus entzinkungsfreiem Messing, Plastik-Hebelgriff, MS-verchromt.

NENNWEITE	10x3/8"x12	10x1/2"x15	10x3/4"x18	2x3/8"x16	2x1/2"x20	2x3/4"x25	2x1"x30	2x1 1/2"x35	5x5/8"x15	5x3/4"x20	5x1"x24	5x1 1/2"x28	5x1 3/4"x32	5x2"x36	6x5/8"x18	6x3/4"x24	6x1"x28	6x1 1/2"x32	6x1 3/4"x36	8x1"x32	8x1 1/2"x36	8x2"x40	8x2 1/2"x44	8x3"x48	8x3 1/2"x52	8x4"x56	8x4 1/2"x60	8x5"x64	8x5 1/2"x68	8x6"x72	8x6 1/2"x76	8x7"x80	8x7 1/2"x84	8x8"x88	8x8 1/2"x92	8x9"x96	8x9 1/2"x100	8x10"x104	8x10 1/2"x108	8x11"x112	8x11 1/2"x116	8x12"x120	8x12 1/2"x124	8x13"x128	8x13 1/2"x132	8x14"x136	8x14 1/2"x140	8x15"x144	8x15 1/2"x148	8x16"x152	8x16 1/2"x156	8x17"x160	8x17 1/2"x164	8x18"x168	8x18 1/2"x172	8x19"x176	8x19 1/2"x180	8x20"x184	8x20 1/2"x188	8x21"x192	8x21 1/2"x196	8x22"x200	8x22 1/2"x204	8x23"x208	8x23 1/2"x212	8x24"x216	8x24 1/2"x220	8x25"x224	8x25 1/2"x228	8x26"x232	8x26 1/2"x236	8x27"x240	8x27 1/2"x244	8x28"x248	8x28 1/2"x252	8x29"x256	8x29 1/2"x260	8x30"x264	8x30 1/2"x268	8x31"x272	8x31 1/2"x276	8x32"x280	8x32 1/2"x284	8x33"x288	8x33 1/2"x292	8x34"x296	8x34 1/2"x300	8x35"x304	8x35 1/2"x308	8x36"x312	8x36 1/2"x316	8x37"x320	8x37 1/2"x324	8x38"x328	8x38 1/2"x332	8x39"x336	8x39 1/2"x340	8x40"x344	8x40 1/2"x348	8x41"x352	8x41 1/2"x356	8x42"x360	8x42 1/2"x364	8x43"x368	8x43 1/2"x372	8x44"x376	8x44 1/2"x380	8x45"x384	8x45 1/2"x388	8x46"x392	8x46 1/2"x396	8x47"x400	8x47 1/2"x404	8x48"x408	8x48 1/2"x412	8x49"x416	8x49 1/2"x420	8x50"x424	8x50 1/2"x428	8x51"x432	8x51 1/2"x436	8x52"x440	8x52 1/2"x444	8x53"x448	8x53 1/2"x452	8x54"x456	8x54 1/2"x460	8x55"x464	8x55 1/2"x468	8x56"x472	8x56 1/2"x476	8x57"x480	8x57 1/2"x484	8x58"x488	8x58 1/2"x492	8x59"x496	8x59 1/2"x500	8x60"x504	8x60 1/2"x508	8x61"x512	8x61 1/2"x516	8x62"x520	8x62 1/2"x524	8x63"x528	8x63 1/2"x532	8x64"x536	8x64 1/2"x540	8x65"x544	8x65 1/2"x548	8x66"x552	8x66 1/2"x556	8x67"x560	8x67 1/2"x564	8x68"x568	8x68 1/2"x572	8x69"x576	8x69 1/2"x580	8x70"x584	8x70 1/2"x588	8x71"x592	8x71 1/2"x596	8x72"x600	8x72 1/2"x604	8x73"x608	8x73 1/2"x612	8x74"x616	8x74 1/2"x620	8x75"x624	8x75 1/2"x628	8x76"x632	8x76 1/2"x636	8x77"x640	8x77 1/2"x644	8x78"x648	8x78 1/2"x652	8x79"x656	8x79 1/2"x660	8x80"x664	8x80 1/2"x668	8x81"x672	8x81 1/2"x676	8x82"x680	8x82 1/2"x684	8x83"x688	8x83 1/2"x692	8x84"x696	8x84 1/2"x700	8x85"x704	8x85 1/2"x708	8x86"x712	8x86 1/2"x716	8x87"x720	8x87 1/2"x724	8x88"x728	8x88 1/2"x732	8x89"x736	8x89 1/2"x740	8x90"x744	8x90 1/2"x748	8x91"x752	8x91 1/2"x756	8x92"x760	8x92 1/2"x764	8x93"x768	8x93 1/2"x772	8x94"x776	8x94 1/2"x780	8x95"x784	8x95 1/2"x788	8x96"x792	8x96 1/2"x796	8x97"x800	8x97 1/2"x804	8x98"x808	8x98 1/2"x812	8x99"x816	8x99 1/2"x820	8x100"x824	8x100 1/2"x828	8x101"x832	8x101 1/2"x836	8x102"x840	8x102 1/2"x844	8x103"x848	8x103 1/2"x852	8x104"x856	8x104 1/2"x860	8x105"x864	8x105 1/2"x868	8x106"x872	8x106 1/2"x876	8x107"x880	8x107 1/2"x884	8x108"x888	8x108 1/2"x892	8x109"x896	8x109 1/2"x900	8x110"x904	8x110 1/2"x908	8x111"x912	8x111 1/2"x916	8x112"x920	8x112 1/2"x924	8x113"x928	8x113 1/2"x932	8x114"x936	8x114 1/2"x940	8x115"x944	8x115 1/2"x948	8x116"x952	8x116 1/2"x956	8x117"x960	8x117 1/2"x964	8x118"x968	8x118 1/2"x972	8x119"x976	8x119 1/2"x980	8x120"x984	8x120 1/2"x988	8x121"x992	8x121 1/2"x996	8x122"x1000	8x122 1/2"x1004	8x123"x1008	8x123 1/2"x1012	8x124"x1016	8x124 1/2"x1020	8x125"x1024	8x125 1/2"x1028	8x126"x1032	8x126 1/2"x1036	8x127"x1040	8x127 1/2"x1044	8x128"x1048	8x128 1/2"x1052	8x129"x1056	8x129 1/2"x1060	8x130"x1064	8x130 1/2"x1068	8x131"x1072	8x131 1/2"x1076	8x132"x1080	8x132 1/2"x1084	8x133"x1088	8x133 1/2"x1092	8x134"x1096	8x134 1/2"x1100	8x135"x1104	8x135 1/2"x1108	8x136"x1112	8x136 1/2"x1116	8x137"x1120	8x137 1/2"x1124	8x138"x1128	8x138 1/2"x1132	8x139"x1136	8x139 1/2"x1140	8x140"x1144	8x140 1/2"x1148	8x141"x1152	8x141 1/2"x1156	8x142"x1160	8x142 1/2"x1164	8x143"x1168	8x143 1/2"x1172	8x144"x1176	8x144 1/2"x1180	8x145"x1184	8x145 1/2"x1188	8x146"x1192	8x146 1/2"x1196	8x147"x1200	8x147 1/2"x1204	8x148"x1208	8x148 1/2"x1212	8x149"x1216	8x149 1/2"x1220	8x150"x1224	8x150 1/2"x1228	8x151"x1232	8x151 1/2"x1236	8x152"x1240	8x152 1/2"x1244	8x153"x1248	8x153 1/2"x1252	8x154"x1256	8x154 1/2"x1260	8x155"x1264	8x155 1/2"x1268	8x156"x1272	8x156 1/2"x1276	8x157"x1280	8x157 1/2"x1284	8x158"x1288	8x158 1/2"x1292	8x159"x1296	8x159 1/2"x1300	8x160"x1304	8x160 1/2"x1308	8x161"x1312	8x161 1/2"x1316	8x162"x1320	8x162 1/2"x1324	8x163"x1328	8x163 1/2"x1332	8x164"x1336	8x164 1/2"x1340	8x165"x1344	8x165 1/2"x1348	8x166"x1352	8x166 1/2"x1356	8x167"x1360	8x167 1/2"x1364	8x168"x1368	8x168 1/2"x1372	8x169"x1376	8x169 1/2"x1380	8x170"x1384	8x170 1/2"x1388	8x171"x1392	8x171 1/2"x1396	8x172"x1400	8x172 1/2"x1404	8x173"x1408	8x173 1/2"x1412	8x174"x1416	8x174 1/2"x1420	8x175"x1424	8x175 1/2"x1428	8x176"x1432	8x176 1/2"x1436	8x177"x1440	8x177 1/2"x1444	8x178"x1448	8x178 1/2"x1452	8x179"x1456	8x179 1/2"x1460	8x180"x1464	8x180 1/2"x1468	8x181"x1472	8x181 1/2"x1476	8x182"x1480	8x182 1/2"x1484	8x183"x1488	8x183 1/2"x1492	8x184"x1496	8x184 1/2"x1500	8x185"x1504	8x185 1/2"x1508	8x186"x1512	8x186 1/2"x1516	8x187"x1520	8x187 1/2"x1524	8x188"x1528	8x188 1/2"x1532	8x189"x1536	8x189 1/2"x1540	8x190"x1544	8x190 1/2"x1548	8x191"x1552	8x191 1/2"x1556	8x192"x1560	8x192 1/2"x1564	8x193"x1568	8x193 1/2"x1572	8x194"x1576	8x194 1/2"x1580	8x195"x1584	8x195 1/2"x1588	8x196"x1592	8x196 1/2"x1596	8x197"x1600	8x197 1/2"x1604	8x198"x1608	8x198 1/2"x1612	8x199"x1616	8x199 1/2"x1620	8x200"x1624	8x200 1/2"x1628	8x201"x1632	8x201 1/2"x1636	8x202"x1640	8x202 1/2"x1644	8x203"x1648	8x203 1/2"x1652	8x204"x1656	8x204 1/2"x1660	8x205"x1664	8x205 1/2"x1668	8x206"x1672	8x206 1/2"x1676	8x207"x1680	8x207 1/2"x1684	8x208"x1688	8x208 1/2"x1692	8x209"x1696	8x209 1/2"x1700	8x210"x1704	8x210 1/2"x1708	8x211"x1712	8x211 1/2"x1716	8x212"x1720	8x212 1/2"x1724	8x213"x1728	8x213 1/2"x1732	8x214"x1736	8x214 1/2"x1740	8x215"x1744	8x215 1/2"x1748	8x216"x1752	8x216 1/2"x1756	8x217"x1760	8x217 1/2"x1764	8x218"x1768	8x218 1/2"x1772	8x219"x1776	8x219 1/2"x1780	8x220"x1784	8x220 1/2"x1788	8x221"x1792	8x221 1/2"x1796	8x222"x1800	8x222 1/2"x1804	8x223"x1808	8x223 1/2"x1812	8x224"x1816	8x224 1/2"x1820	8x225"x1824	8x225 1/2"x1828	8x226"x1832	8x226 1/2"x1836	8x227"x1840	8x227 1/2"x1844	8x228"x1848	8x228 1/2"x1852	8x229"x1856	8x229 1/2"x1860	8x230"x1864	8x230 1/2"x1868	8x231"x1872	8x231 1/2"x1876	8x232"x1880	8x232 1/2"x1884	8x233"x1888	8x233 1/2"x1892	8x234"x1896	8x234 1/2"x1900	8x235"x1904	8x235 1/2"x1908	8x236"x1912	8x236 1/2"x1916	8x237"x1920	8x237 1/2"x1924	8x238"x1928	8x238 1/2"x1932	8x239"x1936	8x239 1/2"x1940	8x240"x1944	8x240 1/2"x1948	8x241"x1952	8x241 1/2"x1956	8x242"x1960	8x242 1/2"x1964	8x243"x1968	8x243 1/2"x1972	8x244"x1976	8x244 1/2"x1980	8x245"x1984	8x245 1/2"x1988	8x246"x1992	8x246 1/2"x1996	8x247"x2000	8x247 1/2"x2004	8x248"x2008	8x248 1/2"x2012	8x249"x2016	8x249 1/2"x2020	8x250"x2024	8x250 1/2"x2028	8x251"x2032	8x251 1/2"x2036	8x252"x2040	8x252 1/2"x2044	8x253"x2048	8x253 1/2"x2052	8x254"x2056	8x254 1/2"x2060	8x255"x2064	8x255 1/2"x2068	8x256"x2072	8x256 1/2"x2076	8x257"x2080	8x257 1/2"x2084	8x258"x2088	8x258 1/2"x2092	8x259"x2096	8x259 1/2"x2100	8x260"x2104	8x260 1/2"x2108	8x261"x2112	8x261 1/2"x2116	8x262"x2120	8x262 1/2"x2124	8x263"x2128	8x263 1/2"x2132	8x264"x2136	8x264 1/2"x2140	8x265"x2144	8x265 1/2"x2148	8x266"x2152	8x266 1/2"x2156	8x267"x2160	8x267 1/2"x2164	8x268"x2168	8x268 1/2"x2172	8x269"x2176	8x269 1/2"x2180	8x270"x2184	8x270 1/2"x2188	8x271"x2192	8x271 1/2"x2196	8x272"x2200	8x272 1/2"x2204	8x273"x2208	8x273 1/2"x2212	8x274"x2216	8x274 1/2"x2220	8x275"x2224	8x275 1/2"x2228	8x276"x2232	8x276 1/2"x2236	8x277"x2240	8x277 1/2"x2244	8x278"x2248	8x278 1/2"x2252	8x279"x2256	8x279 1/2"x2260	8x280"x2264	8x280 1/2"x2268	8x281"x2272	8x281 1/2"x2276	8x282"x2280	8x282 1/2"x2284	8x283"x2288	8x283 1/2"x2292	8x284"x2296	8x284 1/2"x2300	8x285"x2304	8x285 1/2"x2308	8x286"x2312	8x286 1/2"x2316	8x287"x2320	8x287 1/2"x2324	8x288"x2328	8x288 1/2"x2332	8x289"x2336	8x289 1/2"x2340	8x290"x2344	8x290 1/2"x2348	8x291"x2352	8x291 1/2"x2356	8x292"x2360	8x292 1/2"x2364	8x293"x2368	8x293 1/2"x2372	8x294"x2376	8x294 1/2"x2380	8x295"x2384	8x295 1/2"x2388	8x296"x2392	8x296 1/2"x2396	8x297"x2400	8x297 1/2"x2404	8x298"x2408	8x298 1/2"x2412	8x299"x2416	8x299 1/2"x2420	8x300"x2424	8x300 1/2"x2428	8x301"x2432	8x301 1/2"x2436	8x302"x2440	8x302 1/2"x2444	8x303"x2448	8x303 1/2"x2452	8x304"x2456	8x304 1/2"x2460	8x305"x2464	8x305 1/2"x2468	8x306"x2472	8x306 1/2"x2476	8x307"x2480	8x307 1/2"x2484	8x308"x2488	8x308 1/2"x2492	8x309"x2496	8x309 1/2"x2500	8x310"x2504	8x310 1/2"x2508	8x311"x2512	8x311 1/2"x2516	8x312"x2520	8x312 1/2"x2524	8x313"x2528	8x313 1/2"x2532	8x314"x2536	8x314 1/2"x2540	8x315"x2544	8x315 1/2"x2548	8x316"x2552	8x316 1/2"x2556	8x317"x2560	8x317 1/2"x2564	8x318"x2568	8x318 1/2"x2572	8x319"x2576	8x319 1/2"x2580	8x320"x2584	8x320 1/2"x2588	8x321"x2592	8x321 1/2"x2596	8x322"x2600	8x322 1/2"x2604	8x323"x2608	8x323 1/2"x2612	8x324"x2616	8x324 1/2"x2620	8x325"x2624	8x325 1/2"x2628	8x326"x2632	8x326 1/2"x2636	8x327"x2640	8x327 1/2"x2644	8x328"x2648	8x328 1/2"x2652	8x329"x2656	8x329 1/2"x2660	8x330"x2664	8x330 1/2"x2668	8x331"x2672	8x331 1/2"x2676	8x332"x2680	8x332 1/2"x2684	8x333"x2688	8x333 1/2"x2692	8x334"x2696	8x334 1/2"x2700	8x335"x2704	8x335 1/2"x2708	8x336"x2712	8x336 1/2"x2716	8x337"x2720	8x337 1/2"x2724	8x338"x2728	8x338 1/2"x2732	8x339"x2736	8x339 1/2"x2740	8x340"x2744	8x340 1/2"x2748	8x341"x2752	8x341 1/2"x2756	8x342"x2760	8x342 1/2"x2764	8x343"x2768	8x343 1/2"x2772	8x344"x2776	8x344 1/2"x2780	8x345"x2784	8x345 1/2"x2788	8x346"x2792	8x346 1/2"x2796	8x347"x2800	8x347 1/2"x2804	8x348"x2808	8x348 1/2"x2812	8x349"x2816	8x349 1/2"x2820	8x350"x2824	8x350 1/2"x2828	8x351"x2832	8x351 1/2"x2836	8x352"x2840	8x352 1/2"x2844	8x353"x2848	8x353 1/2"x2852	8x354"x2856	8x354 1/2"x2860	8x355"x2864	8x355 1/2"x2868	8x356"x2872	8x356 1/2"x2876	8x357"x2880	8x357 1/2"x2884	8x358"x2888	8x358 1/2"x2892	8x359"x2896	8x359 1/2"x2900	8x360"x2904	8x360 1/2"x2908	8x361"x2912	8x361 1/2"x2916	8x362"x2920	8x362 1/2"x2924	8x363"x2928	8x363 1/2"x2932	8x364"x2936	8x364 1/2"x2940	8x365"x2944	8x365 1/2"x2948	8x366"x2952	8x366 1/2"x2956	8x367"x2960	8x367 1/2"x2964	8x368"x2968	8x368 1/2"x2972	8x369"x2976	8x369 1/2"x2980	8x370"x2984	8x370 1/2"x2988	8x371"x2992
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