

Brakes

Air Brakes for freight trains and passenger trains

Appendix A

Pneumatic brakes accepted in international traffic since 01.01.2004

Appendix B

Pneumatic brakes accepted in international traffic and approved before 01.01.1982

The tables given in this appendix:

- are updated regularly,
- correspond to the above date of update.

Appendix A - Pneumatic brakes certified for international traffic

Appendix A1: Pneumatic brakes certified since 01.01.2004 for newly built and rebuilt vehicles of 'freight-trains' and 'passenger-trains'

Brake design type	Short form	Pneumatic brake	Meeting of UIC-Sector Expert Team 7 "Braking"	Date of approval
		freight train (G) passenger train (P)		
Oerlikon-brake ESG 121 ^{fg} , ESG 121-1 ^{ghi}	O	G/P-brake	January 2003	November 1977
Oerlikon-brake ESH 100 ^k , ESH 200 ^l	O	G/P-brake	March 1988	01.07.1988
SAB-WABCO-brake SW 4 ^m , SW 4C ⁿ , SW 4/3 ^o	SW	G/P-brake	November 1996	01.01.1997
Knorr-brake KE0d-483, KE1d-483; KE2d-483	KE-483 ^t	G/P-brake	Mai 1998	01.06.1998
DAKO-brake CV1nD ^p	DK	G/P-brake	September 2002	01.01.2003
SAB-WABCO-brake C3WR ^{fg}	Ch	G/P-brake	January 2003	January 2003
SAB-WABCO-brake WU-C ^{fg}	WU	G/P-brake	January 2003	January 2003
SAB WABCO-brake GF4 SS1 ^d ; GF4 SS2 ^d GF6 SS1 ^d ; GF6 SS2 ^d	SW	G/P-brake	January 2003	01.02.2003
MZT HEPOS - brake MH3f / HBG 310 / 100 ^g MH3f / HBG 310 / 200 ^g MH3f / HBG 310 / 3xx ^{gd}	MH	G/P-brake	March 2003	April 2003
SAB-WABCO-brake GF SW4-D-AV; GF SW4-S-AV;	SW	G/P-brake	June 2004	01.07.2004
Knorr-brake KE0dv ^s , KE1dv, KE2dv, KERdv ^d	KE	G/P-brake	June 2004	01.07.2004
Bumar Fablok brake MBF-01A ^u	FL	G/P-brake	June 2008	30.06.2008
Bumar Fablok brake MBF-01B ^v	FL	G/P-brake	January 2009	22.01.2009
Bumar Fablok brake MBF-02 ^w	FL	G/P-brake	January 2009	22.01.2009
SAB-WABCO- brake GF6 S-SS1 ^{dx} ; GF6 S-SS2 ^{dx}	SW	G/P-brake	January 2013	01.02.2013
Faiveley Transport brake SW4S ^m , SW4S/3 ^o	SW	G/P-brake	January 2014	15.02.2014
Faiveley Transport brake FT SS1 ^{dy} ; FT SS2 ^{dy}	SW	G/P-brake	January 2014	15.02.2014
Keschwari Electronic Systems brake EDS 300 ^z ;	KES	G/P-brake	September 2014	15.09.2014

Brake design type	Short form	Pneumatic brake	Meeting of UIC-Sector Expert Team 7 "Braking"	Date of approval
		freight train (G) passenger train (P)		
Knorr-brake KKL II ^{aq}	KB	P-brake	January 2016	01.02.2016
Knorr-brake KEf ^b	KE	G/P-brake	June 2018	01.07.2018

- a. Pre-distributor valve for air brake "Passenger" only, to be used solely on vehicles with a main reservoir pipe
- b. Distributor valve for air brake with relay valve KRf type A or KRf type B or KRf type C or KRf type C + KRf type E
- c.
- d. Brake control unit in conjunction with approved load-controlled braking according leaflet 541-04.
- e.
- f. Identity check 2002 achieved.
- g. With recharging about MP a separate pressure reducer is necessary.
- h. Brake control unit, consisting of distributor valve, relay valve and bracket.
- i. Certification see origin ESG 121; in January 1992 application and approval of the reconstruction variant ESG 121-1.
- j.
- k. Without normalised impact up to 14 l of attached brake cylinder - or pre-control reservoir.
- l. With normalised impact.
- m. SW 4 - controlled charging of R reservoir.
- n. SW 4C - controlled charging of brake pipe including overcharging protection with released brake.
- o. SW 4/3 - with cut-off valve of the C3W (charging from A and R runs almost analogously).
- p. The nozzle size of the distributor valve is to be adapted in steps to the R-reservoir volume of the vehicle.
- q. To use only with downstream relay valve.
- r.
- s. At least one relay valve of the type KR, DÜ, DU111, RLV11d or EDUxx1 or EDUxx2 must be connected at the outlet side.
- t. In the position "483" the brake fulfils the conditions of the CIS railways.
- u. Brake module, consisting of distributor valve ZBF-01 and relay valve PBF-01A
- v. Brake module, consisting of distributor valve ZBF-01 and two stage relay valve PBF-01B
- w. Brake module, consisting of distributor valve ZBF-01 and two stage relay valve D11
- x. Brake module, consisting of distributor valve SW4 or SW4C or SW4/3 with one or two relay valves VCAV on C4/2 support
- y. Brake module, consisting of distributor valve SW4S or SW4S/3 with one or two relay valves VCAV on a collector; brake modules FT SS1 and FT SS2 are functionally identical with brake modules GF6 S-SS1 and GF6 S-SS2 and are using the SW4S instead of the SW4
- z. Electronic distributor valve only admitted on vehicles with guaranteed electric power

Appendix A2: Approved pneumatic brakes since 01.01.2004 for rebuilt vehicles of 'freight trains' and 'passenger trains'

Brake design type	Short form	Pneumatic brake	Meeting of UIC-Subcommittee "Braking"	Date of approval
		freight train (G) passenger train (P)		
Knorr-brake KEs, KE 2c AL	KE	G/P-brake	June 1956	
Dako-brake CV1, CV1D, CV1R	DK	G/P-brake	June 1957	
Westinghouse-brake U	WU	G/P-brake	May 1962	
Charmilles-brake C 3 A	Ch	G/P-brake	May 1967	
Oerlikon-brake Est 3f mit HBG 300	O	G/P-brake	Paris, January 1970	
Charmilles-brake C 3 W	Ch	G/P-brake	May 1972	
Knorr-brake KE 0d, KE 1d, KE 2d	KE	G/P-brake	Munich, Oct. 1976	
Westinghouse-brake C3 W2	WE	G/P-brake	Paris, May 1977	
Oerlikon-brake ESG 101, ESG 131	O	P-brake	Bern, November 1977	
Oerlikon-brake ESG 121, ESG 141	O	G/P-brake	Bern, November 1977	
Oerlikon-brake ESG 101-1, ESG 131-1	O	P-brake	-	e)
Oerlikon-brake ESG 121-1, ESG 141-1	O	G/P-brake	-	e)
Knorr-brake KE 0a/3,8, KE 1a/3,8	KE	G/P-brake	Paris, January 1979	
Knorr-brake KE 0ad, KE 1ad, KE 2ad	KE	G/P-brake	Paris, January 1993	01/01/1993
MZT-HEPOS-brake MH3f / HBG 300	MH	G/P-brake	October 1997	
Knorr-brake KE0d ^s , KE1d ^{ab} , KE2d ^a , KERd ^{cd}	KE	G/P-brake	January / March 2003	October 1976
Knorr-brake KE 1a/3,8 ^{bcj}	KE	G/P-brake	January 1979	January 1979
Knorr-brake KE 1ad ^{bc} , KE 2ad ^c	KE	G/P-brake	January 1993	01/01/1993
SAB-WABCO-brake C3W mit AC3D ^f	Ch	G/P-brake	January 2003	January 2003

- a. Identity check 2002 achieved, except of the repeat accuracy of the brake steps.
- b. A downstream connection of other relay valves is not allowed.
- c. Missing repeat accuracy of the brake steps.
- d. Brake control unit in conjunction with approved load-controlled braking according leaflet 541-04.
- e. Date of registration was November 1977 - see design series ESG 101 to 141; presentation and approval of the rebuilding variations ESG from 101-1 to 141-1 took place in January 1992.
- f. Identity check 2002 achieved.
- j. Complementary maintenance arrangements at the MAV, so that the maximum brake cylinder pressure of 3.8 bar is always achieved.
- s. At least one relay valve of the type KR, DÜ, DU111, RLV11d or EDUxx1 or EDUxx2 must be connected at the outlet side.

Appendix B: Pneumatic brakes to be used in existing vehicles

Appendix B1: "Air brakes for freight trains approved before 01.01.1982

This table now serves only to document older types of air brakes, as protection for existing vehicles. It is no longer applicable to either new or renovated wagons

Brake design type	Abridged designation	5th Technical Rolling Stock Committee	Technically approved since
Westinghouse	W	Paris, December 1926	May 1927
Kunze-Knorr	Kk	Paris, December 1926	May 1927
Drolshammer	Dr	Brussels, April 1928	November 1928
Bozic	Bo	Paris, October 1928	November 1928
Hildebrand-Knorr	Hik	Lugano, April 1932	November 1932
Hildebrand-Knorr modified (Hikg 1)	Hik	Baden-Baden, June 1934	November 1934
Breda	Bd	Stresa, October 1934	November 1934
Charmilles	Ch	Stresa, September 1948	December 1948
Oerlikon Est 3 Est/AL	O O	Paris, May 1950 Eastbourne, May 1951	November 1950 November 1951
Knorr KE	KE	Hamburg, July 1954	December 1954
DAKO	DK	Amsterdam, June 1955	December 1955
Westinghouse E 2A	WE		
Knorr KE 0b, KE1b, KE2b, AL, KEs KE 0c, KE 1c, KE 2c, AL ^a	KE	Copenhagen, May-June 1956	December 1956
Oerlikon Est 3d	O	Copenhagen, May-June 1956	
Charmilles C3 ^b	Ch		
Dako CV et CV1 ^c	DK	Paris, June 1957	December 1957
Westinghouse E3 ^d	WE	Paris, June 1957	
Westinghouse E3 à limitation de pression (variante du E3)	WE	Prague, June 1959	
Oerlikon Est 3e	O	Prague, June 1959	
Westinghouse U	WU	Portsmouth, May 1962	
Charmilles C3A	Ch	Stockholm, May 1967	
Westinghouse P4a	WA	Nuremberg, June 1969	
Davies et Metcalfe ^e	DMD3	Sub-Committee Braking, Paris, January 1995	

- Alternatives of the brake Knorr KE admitted in 1954.
- Alternatives of the brake Charmilles admitted in 1948.
- Alternatives of the brake Dako admitted in 1955.
- Alternatives of the brake E 2A admitted in 1956.
- Construction identical to the distributor Est 3f (admitted in January 1970).

The column entitled "Abridged Designation" was added to October 1980.

Appendix B2: “Air brakes for passengers trains approved before 01.01.1982

This table now serves only to document older types of air brakes, as protection for existing vehicles. It is no longer applicable to either new or renovated coaches.

Brake design type	Abridged designation	5th Technical Committee Rolling Stock	Technically approved since
Westinghouse ^a	W		
Knorr ^a	K		
Westinghouse LuR, RL (Lu-R) - RL	W-RL		
Kunze-Knorr ^a	Kk		
Drolshammer ^a	Dr		
Bozic ^a	Bo		
Hildebrand-Knorr ^a	Hik		
Breda ^a	Bd		
Charmilles	Ch	Stresa, September 1948	December 1948
Oerlikon Est 3 Oerlikon Est 4 Oerlikon Ust	O	Paris, May 1950	November 1950
Oerlikon Est/R Oerlikon Est/AL	O	Eastbourne, May 1951	November 1951
Knorr KE	KE	Hamburg, July 1954	December 1954
Dako	DK	Amsterdam, June 1955	December 1955
Westinghouse E 2A	WE		
Knorr KE 0b, KE 1b, KE 2bAL, KEs, KE 0c, KE 1c, KE 2cAL ^b	KE	Copenhagen, May-June 1956	December 1956
Oerlikon Est 3d	O	Copenhagen, May-June 1956	December 1956
Charmilles C3 ^c	Ch	Paris, June 1957	December 1957
Dako CV et CV1 ^d	DK	Paris, June 1957	December 1957
Westinghouse E3 ^e	WE	Paris, June 1957	December 1957
Westinghouse E3 pressure limited (variante of E3)	WE	Prague, June 1959	
Oerlikon Est 3 ^e	O	Prague, June 1959	
Westinghouse U	WU	Portsmouth, May 1962	
Charmilles C 3A	Ch	Stockholm, May 1967	
Westinghouse P 4a	WA	Nuremberg, June 1969	
Davies et Metcalfe ^f	DMD3	Sub-Committee Braking, Paris, January 1995	

- a. These brakes were allowed in international traffic without to be subjected to tests; it is only since 1947 that it was decided that the brakes for passengers trains”, to be allowed in international traffic, should be subjected to international tests, as well as the brakes for freight trains . (Decision of the Committee of Management, November 1947)
- b. Alternatives of the brake Knorr KE admitted in 1954
- c. Alternatives of the brake Charmilles admitted in 1948.
- d. Alternatives of the brake Dako admitted in 1955.
- e. Alternatives of the brake Westinghouse E2A admitted in 1956.
- f. Construction identical to the distributor Est 3f (admitted in January 1970).

The column entitled “Abridged Designation” was added in October 1980

Update information :

Date of actualisation:	Committee:	Decision:
07/04/2004	CTR-steering committee	Establish of an UIC website for components with UIC homologation; Erasing of the suitable appendices in the UIC leaflets
01/10/2004	SC Braking and running gears; conference July 2004	Publication of the 1 st issue of the leaflet 543, appendix E on the UIC website; besides, update of the charts dissolved away from the leaflet; new entry of the pneumatic brakes approved before: <u>Appendix E1:</u> SAB Wabco GF4 SS1, GF4 SS2, GF6 SS1, GF6 SS2; SAB Wabco GF SW4-D-AV, GF SW4-S-AV; Knorr-brake KE1dv, KE2dv, KERdv <u>Appendix E2:</u> MZT-HEPOS-brake: MH3f/HBG300 DAKO-brake CV1nD
01/03/2005	SC Braking and running gears; conference January 2005;	<u>Appendix E1:</u> Item 3.9.1 editorial resumption of the pilot valve KE0d and KE0dv; Item 3.9.2 editorial crossover of the design type KE-483 from leaflet 540 to leaflet 543; <u>Appendix E2:</u> Item 3.9.3 Erasure of pneumatic brakes because they are already performed in appendix E1: Oerlikon ESH 100, ESH 200; SAB Wabco SW4, SW4/C, SW4/3; DAKO CV1nD
01/11/2007	SG5; Braking and running gears conference June 2007;	<u>Appendix E1:</u> Erasure of the following pneumatic brakes, because end of the approving for new design is achieved (01/01/2007): Knorr-brake: KE0d ^s , KE1d ^{ab} , KE2d ^a , KERd ^{cd} , KE 1a/3,8 ^{bcj} , KE 1ad ^{bc} , KE 2ad ^c SAB-WABCO-brake: C3W mit AC3D ^f <u>Appendix E2:</u> Integration of the pneumatic brakes dissolved away from appendix E1: Knorr-brake: KE0d ^s , KE1d ^{ab} , KE2d ^a , KERd ^{cd} , KE 1a/3,8 ^{bcj} , KE 1ad ^{bc} , KE 2ad ^c SAB-WABCO-brake: C3W mit AC3D ^f <u>Appendices E1 + E2:</u> Supplement of the footnote "s" with the anew certificated relay valve "EDU"
11.11.2008	SET7; "Braking" meeting June 2008	<u>Appendix E1:</u> Brake modul Bumar Fablok MBF-01A
01.02.2009	SET7; "Braking" meeting January 2009	<u>Appendix E1:</u> Brake module Bumar Fablok MBF-01B Brake module Bumar Fablok MBF-02
25.03.2013	SET7; "Braking" meeting January 2013	<u>Appendix E1:</u> Brake module Faiveley Transport GF6-SS2 Brake module Faiveley Transport GF6 S-SS2

Date of actualisation:	Committee:	Decision:
23.01.2014	SET7; "Braking" meeting January 2014	<u>Appendix F1 and F2</u> inserted (formerly assigned to leaflet 540 as appendix A1 and A2)
15.02.2014	SET7; "Braking" meeting, January 2014	<u>Appendix E1:</u> Brake module Faiveley Transport SW4S Brake module Faiveley Transport SW4S/3
01.11.2014	SET7; "Braking" E-Mail-inquiry from 22 nd August 2014	<u>Appendix E1:</u> Brake distributor valve Keschwari Electronic Systems EDS 300
01.02.2016	SET7; "Braking" Meeting, January 2016	<u>Appendix E1:</u> Brake pre-distributor valve Knorr KKL II
01.07.2016	SET7; "Braking" Meeting, January 2016	<u>Appendices A and B:</u> Re-introduction of Appendices E1, E2, F1 and F2 of Leaflet 543 as Appendices A1, A2, B1 and B2 of Leaflet 540
17.07.2018	SET7; "Braking" Meeting, June 2018	<u>Appendix A1:</u> Brake distributor valve Knorr KEf with relay valve KRf type C
01.02.2019	SET7; "Braking" Meeting, January 2019	<u>Appendix A1:</u> Brake distributor valve Knorr KEf with relay valve KRf type E
24.07.2023	SET7; "Braking" Meeting, July 2023	<u>Appendix A1:</u> Brake distributor valve Knorr KEf with relay valve KRf type A and with relay valve KRf type B